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Uncertainty, Social Support, Posttraumatic Stress Symptoms and Psychological Growth in Patients with Hematologic Cancers

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Abstract

The purpose of this study was to examine the relationships among uncertainty, perceived social support, posttraumatic stress symptoms and psychological growth in patients with hematologic cancers, and to identify factors influencing posttraumatic stress symptoms and psychological growth.

A predictive correlational design was used. Data were collected by survey interview using questionnaires during 2014, 166 participants diagnosed with hematologic cancer from a university hospital located in Seoul. Uncertainty was measured by Mishel's Uncertainty in Illness Scale – Community Form, perceived social support was measured by Multidimensional Scale of Perceived Social Support, posttraumatic stress symptoms was measured by PTSD Checklist – Civilian Version and psychological growth was measured by Growth Through Uncertainty Scale. Data were analyzed using Windows SPSS 21.0 program.

Significant correlations were identified among all four variables. As a result of multiple regression analysis, uncertainty and perceived social support were discovered to account for 31.2% of the variance in posttraumatic stress symptoms. Perceived social support, bone marrow transplantation or relapse, psychological treatment, and economic status were discovered to account for 23.1% of the variance in psychological growth. The variable that most affected a posttraumatic stress symptom was uncertainty and the variable that most affected a psychological growth was perceived social support.

The results of the study demonstrate the importance of

uncertainty and social support in explaining posttraumatic stress symptoms and psychological growth. Thus, uncertainty and social support needs to be integrated in developing psychosocial interventions to relieve psychological stress and to promote psychological growth in patients with hematologic cancers.

Keywords: uncertainty, social support, posttraumatic stress, psychological growth, hematologic cancer

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CHAPTER I. INTRODUCTION

1. Background

Hematologic cancers are the 10th most common tumor group of adults in Korea with an estimate of 4,367 new cases of non-Hodgkin's lymphoma and 1,719 cases of acute leukemia annually (National Cancer Information Center, 2011). These are the two most common hematologic cancers. Hematologic cancers are the cancers of the bone marrow which is leukemia, and the cancers of the immune system is called the lymphoma and myeloma.

Effective treatment targeting hematologic cancers has marked effects on normal bone marrow and immune function. Consequently, treatment is more complex and debilitating than other cancer treatments, with increased risk of severe infection, and the need for bone marrow support with red blood cells and platelet transfusions. The most complex treatments are autologous and allogeneic bone marrow transplantation. Patients who receive bone marrow transplantation, and high dose chemotherapy treatment requires intensive isolation care for a long time period due to their extremely low immune system (Marrs, 2006; Ropka & Padilla, 2007; Shelton, 2003).

Intensive hematologic cancer therapy, including high-dose chemotherapy, total body irradiation and bone marrow transplantation has been proven to treat the disease and extend patient's life. However, it also has brought severe psychosocial problems. Psychosocial problem such as anxiety, depression and high levels of stress has been shown in previous studies (Lim & Zebrack, 2006;

Foster et al., 2009). The fear of recurrence or relapse also factors the psychosocial problems that the patients experience (Tjemsland, Søreide, & Malt, 1998). It has been shown that patient experience psychological problems both during and after the completion of treatment (Palmer, Kagee, Coyne, & DeMichele, 2004) and psychological distress, has been found in 33~38% of those suffering from hematologic cancer (Persson et al., 2001). In previous study, it has been found that fear and uncertainty about the future were the most commonly identified cancer-related problems in patients with cancer and survivors (Sammarco & Konecny, 2008). These psychosocial problems lead patients with hematologic cancer to have a relatively low quality of life (Persson et al., 2001).

Patients with cancer experience uncertainty as an extreme vulnerability and powerful urge to know what they will experience, whether or not they will survive, and if they survive, what quality of life and ability of function they will have in the future (Byar, Berger, Bakken, & Cetak, 2006). Uncertainty is the greatest source of psychological stress for patients affected by life-threatening illness (Christman et al., 1988). Higher levels of uncertainty are consistently associated with higher levels of emotional distress, reduced quality of life, and poorer psychosocial adjustment (Brennan, 2001; Lazarus, 1986).

According to Mishel's(1990) Uncertainty in Illness theory, people who experience uncertainty for a long time period develop symptoms such as those seen in people with posttraumatic stress disorder (PTSD). Patients with hematologic cancers, who may experience chronic uncertainty is at increased risk for posttraumatic

stress symptoms (PTSS). The diagnosis and treatment of cancer is a potentially traumatic experience that may lead to PTSS. The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) notes that a life-threatening illness 'is not necessarily considered a traumatic event', but that medical incidents that are 'sudden' and 'catastrophic' may qualify, while DSM-IV states that 'being diagnosed with a life-threatening illness' was listed as a potentially traumatic event (American Psychiatric Association, 2000).

There is an increased number of research that suggesting the diagnosis and treatment of cancer may lead to PTSS (Alter et al., 1996; Brennan, 2001). Since PTSS is a significant psychological problem for some patients with cancer (Alter et al., 1996), it is important to investigate the prevalence in patients with hematologic cancer and the predictors of the development of this condition.

The majority of research on cancer-related PTSS focuses on female patients with breast cancer. Less is known about the prevalence of PTSS in other cancer types or patient populations and one of the understudied group is the hematologic patients. Also, theory-based studies testing models predicting psychological outcomes for patient with hematologic cancers are limited. This study is guided by the Mishel's Uncertainty in Illness Theory and Reconceptualization of Uncertainty in Illness Theory (Mishel, 1988, 1990).

In this study, the level of uncertainty, perceived social support, PTSS and psychological growth was measured to find the correlation between these variables. Little research has focused on the uncertainty and PTSS in patient with hematologic cancers. Research on the uncertainty in patients with hematologic cancers in Korea can

illuminate and broaden our understanding of the ways in which uncertainty is experienced in the relationship with PTSS and psychological growth.

2. Purpose of the Study

The purpose of this study was to identify the relationships among uncertainty, perceived social support, PTSS and psychological growth.

The specific aims were: (a) to explore the levels of uncertainty, perceived social support, PTSS and psychological growth experienced in patient with hematologic cancers in Korea, (b) to understand the relationships among uncertainty, perceived social support, PTSS and psychological growth.

By assessing these level and relationships, the medical staff will be able to intervene prior to the development of posttraumatic stress disorder and other psychological problems in patients with hematologic cancer.

3. Definitions of Terms

1) Hematologic Cancer

- Conceptual definition: Cancer that affects the body's blood, bone marrow or lymphatic system. The most common forms of hematologic cancers include: leukemia (occurs when the bone marrow overproduces abnormal white blood cells, and is classified by the type of white blood affected: myeloid or lymphocytic), lymphoma (cancer of the lymphatic system that results in

uncontrolled growth of malignant white blood cells, forming tumors in the lymph nodes. Lymphoma is classified into two main types: Hodgkin's and Non-Hodgkin's lymphoma) (The Korean Society of Hematology, 2011).

- Operational definition: The diagnosis of Acute Myeloid Leukemia (AML), Acute Lymphoblastic Leukemia (ALL), Chronic Myelogenous Leukemia (CML), Chronic Lymphocytic Leukemia (CLL), Myelodysplastic Syndrome (MDS), Hodgkin lymphoma, and Non-Hodgkin lymphoma by a medical doctor.

2) Uncertainty

- Conceptual definition: A cognitive state that occurs in situations where the patient is unable to assign definite values to events or objects and / or is unable to predict outcomes accurately because the cues are unpredictability, ambiguity, complexity, or lack of information (Mishel, 1984).

- Operational definition: Scores on Mishel's Uncertainty in Illness Scale – Community from (MUIS-C). The Korean version of MUIS-C was used in this study has been translated by Chung et.al to deliver a clearer meaning to the participants (Chung, Kim , Rhee, & Do, 2005).

3) Perceived Social Support

- Conceptual definition: A perceived or actually help or support from others, which consists of four types of support: emotional support, integration, tangible help, and informational support (Krause & Markides, 1990).

- Operational definition: Scores on the Multidimensional Scale of Perceived Social Support measurement (Zimet, Dahlem, Zimet, & Farley, 1988). Korean version of the scale was used for the present study (Shin & Lee, 1999).

4) Posttraumatic Stress Symptoms

- Conceptual definition: Complex set of behaviors and symptoms following perception of threat to loss of life including hypervigilance, hyperarousal, avoidant, and intrusive psychological effects (American Psychiatric Association, 2000).
- Operational definition: Participant's scores on the Posttraumatic Stress Disorder Checklist – Civilian version (Weathers, Litz, Herman, Huska, & Keane, 1993). This instrument has not been previously translated in Korean, so it was translated into Korean and the comparability of content was verified through back-translation procedures.

5) Psychological Growth

- Conceptual definition: A result of experiencing serious illness through which individuals relinquish their old life perspective and construct a new view of life (Mishel, 1990, 1999).
- Operational definition: Participant's scores on the Growth Through Uncertainty Scale (GTUS) (Mishel & Fleury, 1997). This instrument also has not been previously translated in Korean, so it was translated into Korean and the comparability of content was verified through back-translation procedures.

CHAPTER II. LITERATURE REVIEW

It has been an area of interest to study the uncertainty in illness in patients living with illness since the early 1980's. Nursing has focused on uncertainty as a main theme of research as well as an area needing assessment in clinical practice because the concept of uncertainty can be applied across different populations and may be worthwhile in explaining the responses to illness. With the development of instrument for measuring uncertainty in illness and the introduction of the mid-range nursing theory of uncertainty in illness by Mishel, many nursing research studies on uncertainty in different clinical populations and also in family members of patients have been conducted (Mishel & D. Epstein, 1997; Mishel, 1981).

1. Uncertainty with Cancer Continuum

A cancer diagnosis is threatening and it brings uncertainty. It can lead to pain, anxiety, unpredictable, and potentially negative outcomes. Furthermore, uncertainty continues in many cancer patient's lives during the treatment and even after the treatment has ended because of the tenuous nature of remission, the possibility of relapse or recurrence, and the unknown and unpredictable after-effects of cancer and treatments (I. Lee, 2004; M. S. Lee, Kim, & Suh, 2008). Although long-term survival rates for cancer have shown dramatic improvements, uncertainty continues to be a prominent theme in research of cancer patient's experience.

The existing studies on cancer related psychosocial responses has shown the adverse effects of uncertainty on cancer patients' well-being and has conceptualized uncertainty as a threat to

psychosocial well-being (I. Lee, 2004; Sammarco, 2001).

In nursing, uncertainty was defined and conceptualized by Mishel (Mishel, 1981, 1988; Mishel & Braden, 1987). Scales for uncertainty in illness were developed for various populations; an adult form, a community form, a parent's form, and a family member form measured uncertainty for different population. Uncertainty in illness was conceptualized as a multidimensional construct composed of ambiguity, unpredictability, complexity, and lack of information (Mishel & Braden, 1987).

Among diverse demographic variables, age, education, and economic status have been often studied with uncertainty. Since those variables are associated with the degree of cognitive capacities for categorizing events, it is assumed that older, more highly educated persons or persons in a higher economic status perceive less uncertainty (Mishel, 1997). Education plays a primary role in providing a person's knowledge base, better interpretation of symptoms (Mishel & Braden, 1988).

Uncertainty results in the inability to have a clear conception of a stressful situation (Lazarus, 1986). Thus, uncertainty may effect either critical or non-critical areas of one's life and may result in either serious or trivial consequences. Empirically, these positive and negative point of view regarding consequences of uncertainty are demonstrated in many research findings.

First, uncertainty may lead to a positive consequence when it allows reassuring interpretation of cues. Particularly in an illness situation, when a patient is unsure about the diagnosis or the severity of illness, it may enable the patient to assume that things will go

well (Mishel, 1990).

On the other hand, uncertainty may lead to negative consequences, uncertainty may cause a great deal of psychosocial stress. Increased uncertainty has been associated with increased stress (Mishel, 1990), more psychological mood disturbance (Christman et al., 1988), increased anxiety, lower level of life quality (Sammarco & Konecny, 2008), reduced coping effectiveness, and perception of diminished or lower health status (Sammarco, 2001). Therefore, uncertainty in illness has been identified as the single greatest source of psychosocial stress to patients.

2. Perceived Social Support in Patients with Cancer

Social support is an important multidimensional construct effecting the patient's ability to deal with the illness (Sjölander & Berterö, 2008). Social support, as one of the structure providers in Mishel's model, has been included as a major variable in relation to uncertainty in illness in several research studies. Social support has been shown in the studies to be an intervening variable that helps to buffer stressful effects of illness (Ferrell, Smith, Ervin, Itano, & Melancon, 2003). Thus the presence of social support protects individuals encountering stressful life circumstances from physical and psychological disturbance (Kim & Lee, 2010). Studies in patients with cancer stated that social support was associated with better psychosocial adjustment to cancer (Sammarco, 2001). Social support may reduce uncertainty by modifying ambiguity concerning the state of illness, complexity perceived in treatment, and the unpredictability of the outcome and future (Mishel, 1990). Social support offers

feedback about the meaning of events, and discussing with significant others may facilitate a person's ability to clarify uncertain events (Sammarco, 2003).

Lower levels of social support significantly correlated with higher levels of uncertainty of illness in patients and family caregivers (Ferrell et al., 2003). Past studies used different valid and reliable instrument for measuring social support and the same uncertainty scale, they showed the same effect of social support on uncertainty in various clinical populations. A strong relationship between social support and uncertainty has been confirmed in several previous study (Sammarco, 2001, 2003; Sammarco & Konecny, 2008).

Perceived social support is the information leading individuals to believe that they are cared for, loved, esteemed, and valued and belong to a network of communication (Huang, Wu, Zhang, Zhang, & Gao, 2010). Social support, particularly the support perceived from close, supportive relationships with spouse and family, may have significant impact on a person's adjustment to cancer (Sjölander & Berterö, 2008). An individual's perception of social support may be determined by the patient's experiences with the world. Such experiences might include negative biases, affective symptoms, and anxiety symptoms and these experiences may change the way an individual interprets and processes information about external occurrences.

Research has demonstrated that past perceived life threat, in addition to perceived and actual social support resources, can contribute to PTSS in cancer patient, survivors and in their family members (Alter et al., 1996). It was found that social support was

one of the variables that could longitudinally predict decreases in the PTSS involving avoidance and numbing (Andrykowski, Cordova, Mcgrath, Sloan, & Kenady, 2000a).

3. Posttraumatic Stress Symptoms in Patients with Cancer

Many aspects of a cancer experience ranging from information delivery about the diagnosis, treatment, threat of recurrence, or the failure of treatment can have the potential of experiencing PTSS (Buonocore, 2004). Physical, cognitive and emotional changes can be left as life-long cancer experience. Some researchers stated that fear and horror typically peak at diagnosis, and also the potential for recurrence or actual recurrence of the cancer (Kangas, Henry, & Bryant, 2002).

For example, prior to the experience of a trauma, such as being diagnosed with cancer, a person may believe that the world is a relatively predictable place, that they have control over their life; and the plans they have made for the future will come (Smith, Redd, Peyser, & Vogl, 1999). Whereas following the diagnosis and treatment, they may begin to realize, as a result of their cancer experience, that the world is not as predictable as they once thought and the plans they have made may not come. This can be extremely distressing and may lead directly to psychological distress as well as indirectly to increased physiological arousal through stimuli that remind them of the trauma of diagnosis and treatment including negative cognitions, intrusive thoughts, ongoing medical appointments, concerns about the future, and uncertainty about recurrence. Additionally, this response may lead to increased negative

psychological responses such as anxiety, negative affect, intrusive thoughts, catastrophic thinking, and intrusive thoughts, which may potentially lead to an increase in PTSS.

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (American Psychiatric Association, 2000) defines PTSD as an anxiety disorder that occurs following a traumatic event that involved actual or threatened death or a threat to one's physical integrity or that of others, and which evoked intense fear, helplessness or horror. Diagnostic criteria include three symptom clusters: re-experiencing in the form of recurrent and intrusive thoughts, avoidance of or numbing in response to trauma-related stimuli, and increased physiological arousal. Criteria must be met for at least one month and cause clinically significant distress or impairment.

The DSM-IV expanded events capable of eliciting a response of PTSD, when compared to the previous editions, to include life-threatening illnesses such as cancer (American Psychiatric Association, 2000). The events that unfold during a cancer diagnosis and subsequent treatment are capable of producing symptoms of posttraumatic stress disorder (Kangas et al., 2002). PTSD and sub-syndromal PTSS are associated with higher rates of depression anxiety disorders (Dirkzwager, Bramsen, & VAN DER PLOEG, 2001), and lower quality of life among cancer patients and survivors (Persson et al., 2001). Cancer patients who experience PTSS also appear to experience negative physical health outcomes, suggesting the need to examine the relationship between posttraumatic stress and physical health symptoms (Andrykowski et al., 2000a; Schwartz &

Drotar, 2006). For example, a study was done to explore the relationship between PTSD and psychological, physical health outcomes among childhood cancer survivors (Schwartz & Drotar, 2006). They reported that higher levels of PTSS were associated with worse psychosocial health outcomes including poorer mood, more depressive symptoms, and worse health-related quality of life when compared with those with fewer PTSS (Schwartz & Drotar, 2006).

While the diagnosis of PTSD is somewhat rare among patients with some types of cancer (Kangas et al., 2002), posttraumatic stress symptoms may occur in up to 50% of all cancer patients (Gurevich et al., 2004). Considering the potentially deleterious effects of PTSS and the fact that incidence of cancer diagnosis continues to rise, cancer-related PTSS have the potential to negatively impact the lives of thousands of people (Jemal et al., 2007).

Numerous studies have documented a link between PTSS and poorer medical prognosis, decreased immune system functioning, longer hospital stays, greater avoidance of medical follow-up, greater declines in compliance with professional recommendations, lower quality of life, increases in life-threatening behaviors, and increases in morbidity rates regardless of time elapsed since medical treatment when compared to non-psychologically distressed patients (Dirkzwager et al., 2001; Jacobsen et al., 2002). This condition cannot be expected to diminish over time in and onset can occur even months after diagnosis and treatment. Detection of PTSS can be reliably assessed using self-report measures or structured interviews. Self-report measures can be more efficient and convenient when assessing the symptoms in cancer patients (Horowitz, Wilner, & Alvarez, 1979).

4. Psychological Growth in Patients with Cancer

More and more research has focused on psychological growth through traumatic experiences such as cancer. Although experiencing trauma and adversity can cause significant psychological and physical distress, exposure to a high level of stress does not always cause people to develop psychiatric disorders (Tedeschi & Calhoun, 1995). Research has shown that even though it is true that many people initially show stress-related symptoms after experiencing traumatic events, some of them demonstrate positive psychological changes and personal growth later on (Park, 2004; Tedeschi & Calhoun, 2004; Tedeschi, Tedeschi, Park, & Calhoun, 1998).

Based on Mishel's Reconceptualization of the theory of uncertainty in chronic illnesses, a new worldview involving probabilistic and conditional thinking serves as a positive psychological outcome under continual uncertainty (Mishel, 1990). Patients with a chronic illness and their families can make a transition from a perspective of life oriented towards control to another one accepting uncertainty as the natural rhythm of life. By accepting continual uncertainty, patients are able to move towards a new view of life which includes reordering priorities, increasing flexibility, and expecting multiple possibilities (Mishel, 1990).

Many qualitative studies have found that cancer patients experienced positive change and personal growth through illness-related uncertainty, but only a few studies (Bailey Jr et al., 2004; Mast, 1998; Porter et al., 2006) have measured growth through uncertainty quantitatively and none of the studies were focused on hematologic cancer patients in Korea. In this study, psychological growth was

measured quantitatively by the instrument, Growth Through Uncertainty Scale (GTUS) (Mishel, 1997). Psychological growth is a dynamic process through illness experiences. Although the direct relationship between uncertainty and psychological growth is not proposed in Mishel's Reconceptualization of Uncertainty in Illness Theory, the relationship between uncertainty and psychological growth through uncertainty was examined in this study (Mishel, 1990).

CHAPTER III. THEORETICAL FRAMEWORK

The theoretical framework that guided this study was formulated from Mishel's middle range theory of Uncertainty in Illness (Mishel, 1988). The theory has been used as a main theoretical framework in many previous qualitative and quantitative studies with cancer population. Uncertainty is the inability of patient to determine the meaning of illness-related events such as their disease process, treatment, or hospitalization (Mishel, 1988). Uncertainty has four elements: ambiguity concerning the state of illness; lack of information about the illness, treatment, treatment effects, and effective management; complexity regarding the available information about the treatment, the system of care, and relationships with providers; and unpredictability of an individual's course of disease, prognosis, and future quality of life and level of function (Mishel, 1981; Mishel & Braden, 1988).

When symptoms form a pattern and events are recognized as familiar, a stimuli frame can be created to lessen uncertainty. A stimuli frame is the form, composition, and structure of stimuli in illness-related events (Mishel, 1988). According to the uncertainty in illness theory, structure providers such as credible authorities, social supports and education can positively affect the stimuli frame and reduce uncertainty directly and indirectly. Credible authority is defined as the degree of trust and confidence patients have in the health care providers (Mishel & Braden, 1988). Credible authority from nurses or physicians affects the formulation of the stimuli frame by providing information on the causes and consequences of symptoms, reducing

uncertainty indirectly. It was proposed that when the health care providers were evaluated as being highly credible, the uncertainty perceived by patients would be lessened (Mishel, 1988; Mishel & Braden, 1987).

As another structure provider, social support has been evaluated for its preventive effects on uncertainty both directly and indirectly (Mishel & Braden, 1987, 1988). Through social support system, patients can obtain or share information about their symptoms and establish a network where patient depends on another's expertise to deal with various threatening events (Mishel, 1988). Social support has been shown to lessen uncertainty.

The third structure provider, education, is also related to uncertainty both indirectly and directly (Mishel & Braden, 1988). Education functions indirectly in relation to uncertainty by providing event associated knowledge that helps from an event structure in stimuli frame. Apparently, education directly influences uncertainty by assisting in the construction of meaning for events and by modifying uncertainty quickly. Therefore, less educated patients need more time to figure out the event, and they experience uncertainty for longer periods of time than more educated patients (Christman et al., 1988; Mishel & Braden, 1988).

Mishel reconceptualized her original theory to more adequately describe individual responses to chronic illness (Mishel, 1990). According to her reconceptualization, individuals can begin to see beneficial aspects of chronic uncertainty and develop probabilistic views of life with support from family, friends, and healthcare providers. Uncertainty is inherently neutral; it can be appraised as

either dangerous or beneficial. In acute illness and other extremely stressful situations in which the threat to life or the integrity to the self is perceived as being great, adults tend to appraise uncertainty as dangerous. When uncertainty is appraised as a danger and coping resources and environment are sufficient, individuals tend to take action to reduce uncertainty (Mishel, 1981). The development of a new view of life is a positive psychological adjustment (Mishel, 1999) and can be perceived as growth through uncertainty (Bailey Jr, Mishel, Belyea, Stewart, & Mohler, 2004).

However, when uncertainty is appraised as a danger and coping resources are insufficient, individuals tend to focus coping efforts on reducing awareness of whatever generates uncertainty and controlling the distressing emotions (Stewart & Mishel, 2000). Although overall uncertainty diminishes over time, unpredictability persists as a source of distress. Higher levels of uncertainty are consistently associated with higher levels of emotional distress, reduced quality of life, and poorer psychosocial adjustment. Higher levels of distressing emotions predict less functional coping (Mishel, 1997). People who experience chronic uncertainty develop symptoms such as those seen in persons with PTSD (Mishel, 1990). Posttraumatic stress symptoms can lead patients to be engaged in health-risk behaviors. For example, an individual may use alcohol or other sedating substances to reduce whatever is causing the uncertainty and to manage emotional distress.

On the basis of Mishel's model, the relationships among uncertainty, perceived social support, PTSS and psychological growth was proposed in this study. Chronic uncertainty may be experienced

in the process of diagnosis, treatment and prognosis of hematologic cancer showing PTSS and/or psychological growth (Mishel, 1990; 1999).

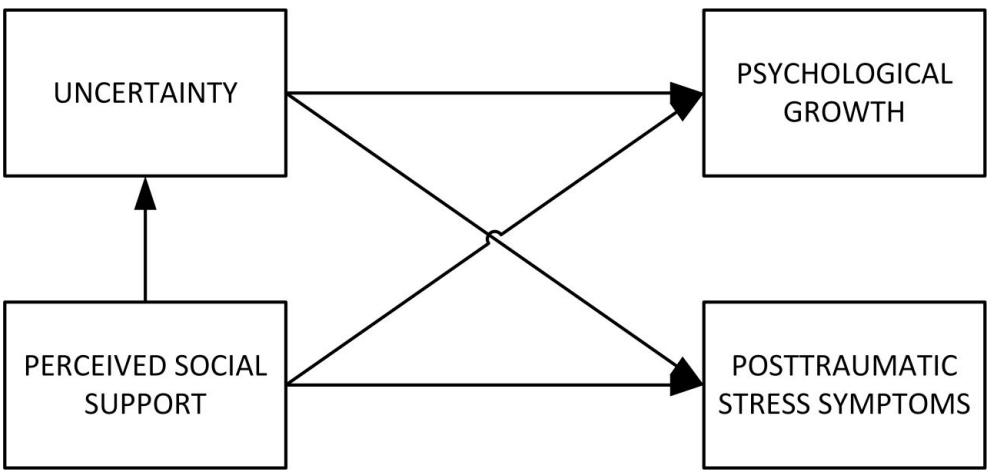

Figure 1. Theoretical model adapted from the Uncertainty in Illness Theory and the Reconceptualization of Uncertainty in Illness Theory (Mishel, 1988, 1990)

CHAPTER IV: METHODS

The purpose of this study was to identify the relationships among uncertainty, perceived social support, posttraumatic stress symptoms and psychological growth. The specific aims are to explore the levels of uncertainty, perceived social support, PTSS and psychological growth experienced in hematologic cancer patients in Korea, to identify the relationships among uncertainty, perceived social support, PTSS and psychological growth.

1. Study Design

This study was a cross-sectional, descriptive, correlational, self-report survey design to examine the levels of uncertainty, perceived social support, PTSS and psychological growth and their relationships. Because the relationship between uncertainty, PTSS and psychological growth in hematologic patients has not been studied, a descriptive design was appropriate.

2. Setting and Sample

The participants was recruited from the hematology in-patient unit and out-patient clinic at a University Hospital which is a tertiary medical center located in Seoul, Korea.

A convenience sampling method was used to obtain participants for this study. In order to obtain a proper sample size which can reveal significant results, G-power program was used. In order to calculate a sample size, the significance level (alpha), effect size, and power must first be determined (Faul, Erdfelder, Buchner, & Lang, 2009).

First, the significance level for the study was set at an alpha level of .05, which means that there is 5% risk of making a Type I error, falsely rejecting a true null hypothesis. For this study, the 5% risk will not be directly harmful to the participants or potential target populations because the study is not associated with any manipulation of patient's care or their environments. This level of alpha is the most acceptable value in behavioral science research (Cohen, 1988).

Secondly, the effect size 0.3 was chosen on the basis of Cohen's recommendation since data on the effect size of relationship between uncertainty and its associated concepts (perceived social support, posttraumatic stress symptoms) in patients with hematologic cancer were not available (Cohen, 1988).

Lastly, a power of .80 was used because it is the minimum acceptable level (Cohen, 1988). Based on this information about the significance level (alpha), effect size, power, and the number of variables and covariates, the sample size of 82 was calculated using the G*Power program. Considering the participants drop outs during the study, 175 participants was approached for this study.

The criteria for inclusion in the study are as follows:

1) The participant must have been diagnosed with hematologic cancer by a medical doctor. Hematologic cancer includes Acute Myeloid Leukemia (AML), Acute Lymphoblastic Leukemia (ALL), Chronic Myelogenous Leukemia (CML), Chronic Lymphocytic Leukemia (CLL), Myelodysplastic syndrome (MDS), Hodgkin lymphoma and Non-Hodgkin lymphoma.
2) The participant must be able to speak and read Korean in order to understand the study questionnaires and answer the

questions.

3) The participant must be an adult, age 19 or older.

Patients who meet these inclusion criteria were screened for the following exclusion criteria.

1) Anyone who had rapidly deteriorating physical health, acute confusional state or memory or cognition difficulty to complete the survey was excluded from the study.

2) Anyone who was mentally disturbed due to their mental health status also excluded from the study.

3. Data Collection Procedure

Data collection took place from July 29th to September 1st of 2014. The participants for this study were recruited from the University Hospital by the investigator. The investigator identified the patients that meet the criteria. Once the participant's eligibility was determined, the investigator approached the participants. At this time, the investigator briefly explained who she is and the purpose of the study, and the written summary of the study was be given. If the patient was interested in participating in the study, they received a self-administered questionnaires designed to assess uncertainty, perceived social support, and PTSS. The participants were instructed to answer the questionnaires with reference to their experience of cancer and not to make reference to pervious psychological disorder, other chronic illness experiences or previous trauma. In addition, information about their diagnosis and treatment and demographic profiles such as age, gender, marital status and religion was be obtained. Gathered data were used to describe the relationship between

uncertainty, social support and PTSS.

Overall, 175 participants' information were gathered during the study period. However, 9 cases were excluded; 6 because of inadequate information provided and 3 for the worsening of the participant's general physical condition. Finally, data on 166 participants were included in the final analysis. 78 participants were patients who were admitted on the hematologic unit and 88 patients who were reached at the outpatient clinic.

4. Measures

The four main concepts for the study (uncertainty, perceived social support, posttraumatic stress symptoms, and psychological growth) was measured by four different instruments (Table 1).

Table 1. Study Concepts & Measurements

Variables	Instrument	No. of Items
Uncertainty	Mishel's Uncertainty in Illness Scale – Community Form (MUIS-C)	23
Perceived Social Support	Multidimensional Scale of Perceived Social Support (MSPSS)	12
Posttraumatic Stress Symptoms	PTSD Checklist – Civilian version (PCL-C)	17
Psychological Growth	Growth Through Uncertainty Scale (GTUS)	39

1) Demographic variables

A questionnaire was given, collecting information on demographics (gender, age, marital status, economic status, education and religion), illness related characteristics (type of cancer, time since diagnosis, and time since treatment and type of treatment undergone, history of treatment for psychiatric disorder). In this study, the patient's functional status or the medical chart information such as complete blood count (CBC) and other medical examination results were not included in the present study. The reason was that because hematologic cancer patients joined the study at all different course of their treatment. Patients who had been diagnosed for a longer period of time were likely to have more medical knowledge and information about the disease.

2) Uncertainty

Mishel's Uncertainty in Illness Scale-Community Form (MUIS-C) was used to measure the uncertainty in illness. The community version was developed in 1986 by Mishel and it was derived from the Mishel's Uncertainty in Illness Scale (MUIS) developed in 1981 (Mishel & Epstein, 1997; Mishel, 1981). The MUIS-C is a 23-item-self-administered measure that uses a five-point Likert-type response format, ranging from 1 (strongly disagree) to 5 (strongly agree). Scores for all items were summed. Scores can range from 23 to 115, with a midrange score of 69. The higher scores reflect higher levels of uncertainty (Mishel & Epstein, 1997).

The MUIS-C has been utilized in many research studies on uncertainty in diverse populations, including patients with cancer,

myocardial infarction, atrial fibrillation, and renal disease (Arroll, Dancey, Attree, Smith, & James, 2012; Bailey et al., 2010; Chiou & Chung, 2012; Davis et al., 2013; Haisfield-Wolfe et al., 2012; Kang, 2011; Mishel & Epstein, 1997). These previous studies have shown MUIS-C to be a reliable and valid instrument for measuring illness uncertainty across different diseases (Mishel, 1997). The reliability of the MUIS-C has been reported in the moderate to high range (α = .74-.92). For this study, the internal consistency was Cronbach's alpha = 0.870. The construct validity was also supported by the MUIS-C in terms of its external associations with indicators of theoretically related variables. For example, mean uncertainty score has been shown to decrease with an increase in level of education across population subgroups (Mishel & Epstein, 1997). In women who were newly diagnosed with gynecological cancers, higher levels of uncertainty have been associated with more adjustment problems (Mishel, Hostetter, King, & Graham, 1984). The Korean version of MUIS-C that was used in this study has been translated by Chung et.al (Chung et al., 2005).

3) Perceived Social Support

Multidimensional Scale of Perceived Social Support (Zimet et al., 1988) was used to measure the social support in hematologic cancer patients. The MSPSS is a 12-item scale with a five point scale (from 1 = strongly disagree to 5 = strongly agree) with potential range of the total score of 12 to 60. This measures three sources of support with four questions each: support from family, friends and significant other. In this study, significant other was appointed as the medical staff, such as doctors and nurses. Adequate internal and

test-re-test reliability have been demonstrated as well as strong factorial validity and moderate construct validity. Factor analysis has demonstrated that respondents clearly differentiate between three sources of social support (family, friends, and a special other) (Zimet et al., 1988). Cronbach's coefficient alphas have been obtained for the whole measure and for each subscale. The reliability for the entire measure was α =.88, and for significant other, family, and friends, the values were α =.91, α =.87, and α =.85, respectively. Test retest reliability for each of these same scales was .85, .75, and .72, respectively (Zimet et al., 1988).

The Korean version of MSPSS has already been developed, and its reliability has been proven. The Korean version has a five point scale, being different from the original one (Shin & Lee, 1999). In this study, significant other subscale is defined as the support from medical team (doctor, nurse and medical staff). For this study, the internal consistency was 0.879.

4) Posttraumatic Stress Symptoms

PTSS were assessed by using the PTSD Checklist – Civilian version (PCL-C) (F. Weathers, Huska, & Keane, 1991). The PCL-C is a 17-item scale of PTSD symptomatology questionnaire that corresponds directly to the DSM criteria for PTSD. Items on the PLC-C are rated on a four-point Likert-type scale with responses ranging from "Not at all" to "Extremely." The PCL-C provides a continuous score (17-85) based on the quantity and severity of symptoms allowing it to assess the level of PTSS.

The PCL-C has three subscales assessing symptoms from the

three DSM-IV symptom clusters, namely re-experiencing, avoidance, and increased arousal. Examples of items on each of the three sub-scales include; Re-experiencing symptoms “Repeated, disturbing memories, thought, or images of a stressful experience?” and “Suddenly acting or feeling as if a stressful experience were happening again as if you were reliving it?”; Avoidance symptoms “Avoiding thinking about or talking about a stressful experience or avoiding having feelings related to it?” and “Feeling emotionally numb or being unable to have loving feelings for those close to you”; and; Increased arousal symptoms “Having physical reactions (e.g. heart pounding, trouble breathing, sweating) when something reminded you of a stressful experience?” and “Feeling jumpy or easily startled?”

The PCL-C has demonstrated good psychometric properties, including high internal consistency and retest reliability (Ruggiero, Del Ben, Scotti, & Rabalais, 2003), and convergent validity with other common PTSD symptoms measures (F. W. Weathers, Keane, & Davidson, 2001). The PCL-C has been used in research with cancer patient and survivors (Andrykowski, Cordova, Mcgrath, Sloan, & Kenady, 2000b; Morrill et al., 2008; Smith, Redd, DuHamel, Vickberg, & Ricketts, 1999). For this study, the internal consistency was 0.907.

5) Psychological Growth

Psychological growth in this study was measured by the translation of 39-item Growth Through Uncertainty Scale (GTUS) (Mishel & Fleury, 1997). The GTUS measures psychological growth as a result of experiencing serious illness through which individuals

change their old life perspective and build a new view of life (Mishel, 1990). The GTUS is the first instrument designed to measure positive psychological changes and personal growth through illness-related uncertainty. This 39-item scale uses the 5-point, Likert-scale which ranges from 1= “totally disagree” to 6= “totally agree.” The potential range of the score from 39 to 195. A total score is calculated by summing up scores on all the items, with higher scores indicating more psychological growth through uncertainty and the changes in life view.

Alpha coefficients for the total scale were .94 in a study of men with prostate cancer (Bailey Jr et al., 2004) and .95 in one study with breast cancer survivors (Porter et al., 2006) and .94 on another study with breast cancer survivors (Mast, 1998). For this study, the internal consistency was 0.929. Construct validity was also supported by the negative correlation with the Profile of Mood states Scale (POMS) (Mast, 1998). In this study, the GTUS was translated into Korean and the comparability of content was verified through back-translation procedures.

5. Data Analysis

The data was analyzed by using the Statistical Package for Social Science (SPSS) software program, version 21.0. Descriptive statics were obtained for the socio-demographic and illness related characteristics, including age, marital status, educational level, socioeconomic state, employment status, type of cancer and treatment, uncertainty level (MUIS score), perceived social support (MSPSS score), posttraumatic stress symptoms (PCL-C score) and psychological

growth (GTUS score). For evaluating the relationship among attachment uncertainty, social support, PTSS and psychological growth, Pearson's correlation coefficients were performed. Linear regression analysis was used to explore the predictors for PTSS and psychological growth. The significance level was set at 0.05.

6. Ethical Consideration

Approval from a University Hospital Institutional Review Board that the researcher is affiliated with for this study was obtained prior to participant recruitment (IRB number: H-1406-031-584). The investigator discussed the study with the eligible patients, before being asked to participate in the study, both verbal information and written information was given (the purpose and procedure of the study). At this time, the participants were informed that the participation is voluntary and that they are able to drop out of the study at any time. And that their decision to participate or not to participate in the study will not influence the care they receive at the hospital. If the patient agreed to participate in the study, he or she read the informed consent form, and were asked to sign the written consent form. A copy of the consent form was given to the participant.

Potential risks to the patients who participate in the study were not anticipated since any known medical or legal risks exist when gathering the data using a questionnaire. The participants received a small token for participating in the study however, strictly speaking, there are no other direct benefits for the participants, but the results of the study may help health providers understand the

phenomena of patient's uncertainty and the study provided an opportunity for participants to express their perceptions and responses to hematologic cancer through the questionnaires.

The investigator protected the confidentiality of the participants by transcribing all data by code numbers. The only identifying information on the data was the code number and no names were attached to the questionnaires. All of the obtained data from the participants were only used for the purpose of the study. All of the collected data were entered into the computer, to which only the investigator has access, and the questionnaires for the study was destroyed upon completion of the study. Each participant were informed of the study procedure and how participant's confidentiality will be protected, through the written consent form and verbal explanation by the investigator.

CHAPTER V: RESULTS

1. Characteristics of the Participants

The demographic characteristics of the sample for this present study are shown on Table 1, including age, gender, education, employment, marital status, economic status and religion.

A total of 166 hematologic cancer patients participated for this study. Their mean age was 50.28 years old ranging from 19 to 82 years old. Male participants were 105 (63.3%) and 61 female (36.7%) participated. Fifty percent (n=83) of the participants had a college or higher degree, 68 participants (41%) graduate high school and 15 participants had went to middle school or less . Eighty-six participants were employed (51.8%) and 80 participants (48.2%) were not employed. 120 participants were married (72.3%) and 46 participants were not married (27.7%) (Table 2).

Table 2. Demographic Characteristics of the Participants (N=166)

Characteristics	Category	N (%)	Mean (SD[a])	Min-Max
Age (years)	20-30	38 (22.9)	50.28 (14.97)	19 - 82
	40-50	84 (50.6)		
	≥60	44 (26.5)		
Gender	Male	105 (63.3)		
	Female	61 (36.7)		
Education	≤ Middle school	15 (9.0)		
	High school	68 (41.0)		
	≥ College	83 (50)		
Employment	Employed	86 (51.8)		
	Unemployed	80 (48.2)		
Marital status	Single	46 (27.7)		
	Married	120 (72.3)		
Economic status	Good	10 (6.0)		
	Moderate	123 (74.1)		
	Low	33 (19.9)		
Religion	Yes	104 (62.7)		
	No	62 (37.3)		

[a] standard deviation

Disease-related characteristics included the type of hematologic cancer, period since diagnosed, experience of relapse and if the patient is admitted on the unit, if the patient received bone marrow transplantation and if they ever experienced relapse of their disease are presented in Table 3.

Majority of the participants were diagnosed with Acute Myeloid Leukemia (AML) or Acute Lymphoblastic Leukemia (ALL) (n=79, 47.6%), 20 participants (12.0%) were diagnosed with Chronic Myelogenous Leukemia (CML) or Chronic Lymphocytic leukemia, the rest (n=67, 40.4%) were diagnosed with Myelodysplastic Syndrome or lymphoma. Less than 3 months since diagnosis was 27 participants (16.3%), more than 3 months to less than a year was 48 participants (28.9%), more than a year to 3 years was 47 participants (28.3%), more than 3 years was 44 participants (26.5%).

19 participants (11.4%) did not receive bone marrow transplantation (BMT) and experienced relapse of their disease, 93 participants (56.0%) did not receive bone marrow transplantation and also did not experience relapse, 25 participants (15.1%) did receive bone marrow transplantation and also experience relapse, 29 participants (17.5%) received bone marrow transplantation and did not experience relapse.

18 participants (10.8%) experienced relapse of their disease and were admitted on the unit, 58 participants (34.9%) did not experience relapse and were admitted on the unit, 23 participants (13.9%) experienced relapse and were not admitted on the unit, 67 participants (40.4%) did not experience relapse nor admitted on the unit. 47 participants (28.3%) had other disease such as hypertension,

diabetes, hyperlipidemia, hemorrhoid, and so on.

Table 3. Disease-related Characteristics of the Participants (N=166)

Characteristics	Category	N (%)	Mean (SD[a])	Min-Max
Type of Cancer	Acute (AML[b],ALL[c])	79 (47.6)		
	Chronic (CML[d],CLL[e])	20 (12.0)		
	Others (MDS[f],Lymphoma)	67 (40.4)		
Period since Diagnosis (months)	~ <3	27 (16.3)	28.91 (37.14)	1 - 204
	4~12	48 (28.9)		
	13~36	47 (28.3)		
	< 36 ~	44 (26.5)		
BMT[g]and Relapse	BMT(N[h])Relapse(Y[i])	19 (11.4)		
	BMT(N) Relapse(N)	93 (56.0)		
	BMT(Y) Relapse(Y)	25 (15.1)		
	BMT(Y) Relapse(N)	29 (17.5)		
Relapse and Admission	Relapse(Y) Admission(Y)	18 (10.8)		
	Relapse(N) Admission(Y)	58 (34.9)		
	Relapse(Y) Admission(N)	23 (13.9)		
	Relapse(N) Admission(N)	67 (40.4)		
Psychological Treatment	Yes	14 (8.4)		
	No	152 (91.6)		
Other Disease	Yes	47 (28.3)		
	No	119 (71.7)		

[a] standard deviation

[b] acute myeloid leukemia, [c] acute lymphoblastic leukemia

[d] chronic myelogenous leukemia, [e] chronic lymphocytic leukemia

[f] myelodysplastic syndrome

[g] bone marrow transplantation

[h] no(have not experienced), [i] yes(have experienced)

2. Standardized Scores of Uncertainty, Perceived Social Support, Posttraumatic Stress Symptoms and Psychological Growth

Uncertainty, the mean score for MUIS-C was 61.06(±13.64) with scores ranging from 31 to 94. Perceived social support, the mean score for MPSS was 42.79(±8.10) with scores ranging from 12 to 60. Posttraumatic stress symptoms, the mean score for PCL-C was 44.02(±8.10) with scores ranging from 17 to 76. Psychological growth, the mean score for GTUS was 132.10(±20.39) with scores ranging from 63 to 186.

Table 4. Standardized Scores of the Measures

Measures	Mean ± SD[a]	Range
Uncertainty	61.06 ± 13.64	31 - 94
Perceived Social Support	42.79 ± 8.10	12 - 60
Posttraumatic Stress Symptoms	44.02 ± 13.45	17 - 76
Psychological Growth	132.10 ± 20.39	63 - 186

[a] standard deviation

Analyses were performed to determine whether the main study variables were significantly associated with demographic variables and disease-related characteristics.

1) Uncertainty by Characteristics of the Participants

ANOVA revealed that age and education level was significantly associated with uncertainty. Participants who were older than 60 years old experienced more uncertainty than participants age 20 years to 39 years old or 40 to 59 years old. Participants who had lesser education than middle school experienced higher level of uncertainty than participants who had a college degree or higher (Table 5).

Table 5. Uncertainty by Demographic Characteristics of the Participants (N=166)

Characteristics	Category	Uncertainty		
		Mean (SD[a])	t or F	*p* (Scheffe)
Age (years)	20-39	2.40 (0.55)	10.67	0.000* a<c, b<c
	40-59	2.60 (0.55)		
	≥ 60	2.96 (0.57)		
Sex	Male	2.63 (0.59)	0.03	0.851
	Female	2.69 (0.59)		
Education	≤ Middle school	3.05 (0.49)	6.20	0.003* a>c
	High school	2.72 (0.61)		
	≥ College	2.52 (0.55)		
Employment	Employed	2.52 (0.61)	1.93	0.167
	Unemployed	2.79 (0.53)		
Marital status	Single	2.49 (0.59)	0.09	0.760
	Married	2.71 (0.58)		
Economic status	Good	2.31 (0.73)	1.79	0.169
	Moderate	2.67 (0.57)		
	Low	2.69 (0.59)		
Religion	Yes	2.62 (0.60)	0.09	0.754
	No	2.70 (0.57)		

* coefficients significant at $p<.05$

[a] standard deviation

It also showed that the period since the diagnosis of hematologic cancer, if the participant received bone marrow transplantation and experienced relapse, if the participant experienced relapse and admitted in the hospital, whether if the patient has another medical condition was significantly associated with uncertainty. Participants who have been 13 to 36 months since diagnosis experienced more uncertainty than participants who have been less than 3 months of diagnosis. It has shown that participants who did not receive bone marrow transplantation and experienced relapse of their disease had higher levels of uncertainty than participants who did not receive bone marrow transplantation and also did not experience relapse of their disease. Participants who did not experience relapse of their disease and are admitted in the hospital had lower levels of uncertainty than who experienced relapse and not admitted in the hospital. And participants who experienced relapse and not admitted in the hospital had higher levels of uncertainty than participants who did not experience relapse nor admitted in the hospital (Table 6).

Table 6. Uncertainty by Disease-related Characteristics (N=166)

Characteristics	Category	Uncertainty		
		Mean (SD[a])	t or F	*p* (Scheffe)
Type of Cancer	Acute (AML[b],ALL[c])	2.64 (0.59)	0.33	0.719
	Chronic (CML[d],CLL[e])	2.75 (0.54)		
	Others (MDS[f],Lymphoma)	2.63 (0.61)		
Period since Diagnosis (months)	~ < 3	2.30 (0.50)	4.61	0.004* c>a
	4~12	2.65 (0.58)		
	13~36	2.82 (0.59)		
	< 36 ~	2.68 (0.58)		
BMT[g] and Relapse	BMT(N[h])Relapse(Y[i])	2.98 (0.63)	4.83	0.003* a>b
	BMT(N) Relapse(N)	2.53 (0.55)		
	BMT(Y) Relapse(Y)	2.89 (0.49)		
	BMT(Y) Relapse(N)	2.62 (0.66)		
Relapse and Admission	Relapse(Y) Admission(Y)	2.81 (0.62)	5.03	0.002* b<c, c>d
	Relapse(N) Admission(Y)	2.59 (0.61)		
	Relapse(Y) Admission(N)	3.03 (0.51)		
	Relapse(N) Admission(N)	2.53 (0.53)		
Psychological Treatment	Yes	2.64 (0.58)	0.00	0.967
	No	2.80 (0.64)		
Other Disease	Yes	2.72 (0.66)	4.57	0.034*
	No	2.62 (0.56)		

* coefficients significant at $p<.05$

[a] standard deviation

[b] acute myeloid leukemia, [c] acute lymphoblastic leukemia

[d] chronic myelogenous leukemia, [e] Chronic lymphocytic leukemia

[f] myelodysplastic syndrome

[g] bone marrow transplantation

[h] no(have not experienced), [i] yes(have experienced)

2) Perceived Social Support by Characteristics of the Participants

ANOVA revealed that education level was significantly associated with the level of perceived social support. Participants with a college degree or higher had higher level of social support than participants with education less than middle school (Table 7).

Table 7. Perceived Social Support Demographic Characteristics of the Participants (N=166)

Characteristics	Category	Perceived Social Support		
		Mean (SD[a])	t or F	*p* (Scheffe)
Age (years)	20-39	3.88 (0.66)	2.44	0.090
	40-59	3.91 (0.75)		
	≥ 60	3.61 (0.78)		
Sex	Male	3.78 (0.71)	0.78	0.377
	Female	3.90 (0.81)		
Education	≤ Middle school	3.48 (0.89)	3.33	0.038* c>a
	High school	3.74 (0.71)		
	≥ College	3.96 (0.73)		
Employment	Employed	3.88 (0.70)	1.57	0.211
	Unemployed	3.76 (0.79)		
Marital status	Single	3.75 (0.82)	0.66	0.417
	Married	3.85 (0.72)		
Economic status	Good	4.04 (0.57)	1.01	0.365
	Moderate	3.84 (0.75)		
	Low	3.68 (0.77)		
Religion	Yes	3.87 (0.80)	1.75	0.187
	No	3.75 (0.65)		

* coefficients significant at $p<.05$

[a] standard deviation

It also showed that type of cancer and period since diagnosis was significantly associated with the level of perceived social support. Participants diagnosed with AML and ALL had higher levels of social support than participants diagnosed with CML and CLL. Participants diagnosed less 3 months ago had higher levels of social support than participants diagnosed more than 3 years ago (Table 8).

Table 8. Perceived Social Support by Disease-related Characteristics

(N=166)

Characteristics	Category	Perceived Social Support		
		Mean (SD[a])	t or F	*p* (Scheffe)
Type of Cancer	Acute (AML[b],ALL[c])	3.96 (0.60)	5.12	0.007* a>b
	Chronic (CML[d],CLL[e])	3.37 (0.92)		
	Others (MDS[f],Lymphoma)	3.80 (0.80)		
Period since Diagnosis (months)	~ < 3	4.21 (0.63)	3.33	0.021* a>d
	4~12	3.84 (0.73)		
	13~36	3.72 (0.78)		
	< 36 ~	3.68 (0.74)		
BMT[g] and Relapse	BMT(N[h])Relapse(Y[i])	0.94 (0.21)	0.16	0.170
	BMT(N) Relapse(N)	0.73 (0.76)		
	BMT(Y) Relapse(Y)	0.58 (0.11)		
	BMT(Y) Relapse(N)	0.75 (0.14)		
Relapse and Admission	Relapse(Y) Admission(Y)	3.68 (0.67)	2.61	0.053
	Relapse(N) Admission(Y)	4.02 (0.69)		
	Relapse(Y) Admission(N)	3.56 (0.81)		
	Relapse(N) Admission(N)	3.78 (0.76)		
Psychological Treatment	Yes	3.83 (0.75)	0.14	0.700
	No	3.79 (0.77)		
Other Disease	Yes	3.77 (0.70)	0.38	0.535
	No	3.85 (0.77)		

* coefficients significant at $p<.05$

[a] standard deviation

[b] acute myeloid leukemia, [c] acute lymphoblastic leukemia

[d] chronic myelogenous leukemia, [e] chronic lymphocytic leukemia

[f] myelodysplastic syndrome

[g] bone marrow transplantation

[h] no(have not experienced), [i] yes(have experienced)

3) Posttraumatic Stress Symptoms by Characteristics of the Participants

Age was significantly associated with the level of PTSS. Participants older than 60 years old had higher levels of PTSS than participants' age from 20 to 39 years old (Table 9).

Table 9. Posttraumatic Stress Symptoms by Demographic Characteristics of the Participants (N=166)

Characteristics	Category	Posttraumatic Stress Symptoms		
		Mean (SD[a])	t or F	*p* (Scheffe)
Age (years)	20-39	2.40 (0.85)	4.32	0.015* c>a
	40-59	2.52 (0.76)		
	≥60	2.87 (0.71)		
Sex	Male	2.56 (0.78)	0.01	0.893
	Female	2.63 (0.81)		
Education	≤ Middle school	2.74 (0.85)	0.30	0.738
	High school	2.56 (0.75)		
	≥ College	2.58 (0.81)		
Employment	Employed	2.52 (0.75)	0.90	0.343
	Unemployed	2.65 (0.82)		
Marital status	Single	2.57 (0.87)	1.91	0.168
	Married	2.59 (0.76)		
Economic status	Good	2.41 (0.92)	0.64	0.526
	Moderate	2.57 (0.76)		
	Low	2.70 (0.86)		
Religion	Yes	2.61 (0.82)	2.21	0.138
	No	2,54 (0.73)		

* coefficients significant at $p<.05$

[a] standard deviation

None of the disease-related characteristics were significantly associated with posttraumatic stress symptoms (Table 10).

Table 10. Posttraumatic Stress Symptoms by Disease-related Characteristics (N=166)

Characteristics	Category	Posttraumatic Stress Symptoms		
		Mean (SD[a])	t or F	*p*
Type of Cancer	Acute (AML[b],ALL[c])	2.59 (0.73)		
	Chronic (CML[d],CLL[e])	2.71 (0.88)	0.31	0.728
	Others (MDS[f],Lymphoma)	2.55 (0.83)		
Period since Diagnosis (months)	~ < 3	2.27 (0.69)		
	4~12	2.53 (0.85)	2.52	0.059
	13~36	2.78 (0.82)		
	< 36 ~	2.63 (0.69)		
BMT[g] and Relapse	BMT(N[h])Relapse(Y[i])	0.87 (0.20)		
	BMT(N) Relapse(N)	0.75 (0.07)	1.12	0.339
	BMT(Y) Relapse(Y)	0.68 (0.13)		
	BMT(Y) Relapse(N)	0.92 (0.17)		
Relapse and Admission	Relapse(Y) Admission(Y)	2.75 (0.88)		
	Relapse(N) Admission(Y)	2.40 (0.81)	2.15	0.095
	Relapse(Y) Admission(N)	2.83 (0.63)		
	Relapse(N) Admission(N)	2.61 (0.76)		
Psychological Treatment	Yes	2.55 (0.79)	2.85	0.093
	No	2.97 (0.60)		
Other Disease	Yes	2.62 (0.83)	0.42	0.516
	No	2.57 (0.77)		

[a] standard deviation

[b] acute myeloid leukemia, [c] acute lymphoblastic leukemia

[d] chronic myelogenous leukemia, [e] chronic lymphocytic leukemia

[f] myelodysplastic syndrome

[g] bone marrow transplantation

[h] no (have not experienced), [i] yes (have experienced)

4) Psychological Growth by Characteristics of the Participants

None of the general characteristics and disease-related characteristics was significantly associated with psychological growth in patients with hematologic cancer (Table 11).

Table 11. Psychological Growth by Demographic Characteristics of the Participants (N=166)

Characteristics	Category	Psychological Growth		
		Mean (SD[a])	t or F	*p*
Age (years)	20-39	3.38 (0.38)	1.72	0.182
	40-59	3.44 (0.56)		
	≥60	3.26 (0.53)		
Sex	Male	3.35 (0.50)	0.33	0.563
	Female	3.43 (0.54)		
Education	≤ Middle school	3.13 (0.73)	2.26	0.107
	High school	3.37 (0.54)		
	≥ College	3.44 (0.44)		
Employment	Employed	3.44 (0.56)	1.19	0.277
	Unemployed	3.32 (0.46)		
Marital status	Single	3.33 (0.44)	1.83	0.177
	Married	3.40 (0.54)		
Economic status	Good	3.72 (0.69)	3.04	0.050
	Moderate	3.39 (0.48)		
	Low	3.26 (0.56)		
Religion	Yes	3.38 (0.54)	1.18	0.278
	No	3.38 (0.48)		

[a] standard deviation

None of the disease-related characteristics was significantly associated with psychological growth in patients with hematologic cancer (Table 12).

Table 12. Psychological Growth by Disease-related Characteristics

(N=166)

Characteristics	Category	Psychological Growth		
		Mean (SD[a])	t or F	*p*
Type of Cancer	Acute (AML[b],ALL[c])	3.35 (0.48)		
	Chronic (CML[d],CLL[e])	3.25 (0.58)	1.39	0.252
	Others (MDS[f],Lymphoma)	3.46 (0.54)		
Period since Diagnosis (months)	~ < 3	3.53 (0.55)		
	4~12	3.35 (0.51)	1.57	0.197
	13~36	3.28 (0.54)		
	< 36 ~	3.44 (0.48)		
BMT[g] and Relapse	BMT(N[h]) Relapse(Y[i])	0.39 (0.91)		
	BMT(N) Relapse(N)	0.50 (0.05)	1.12	0.339
	BMT(Y) Relapse(Y)	0.52 (0.10)		
	BMT(Y) Relapse(N)	0.60 (0.11)		
Relapse and Admission	Relapse(Y) Admission(Y)	3.19 (0.39)		
	Relapse(N) Admission(Y)	3.47 (0.56)	1.38	0.250
	Relapse(Y) Admission(N)	3.40 (0.57)		
	Relapse(N) Admission(N)	3.35 (0.48)		
Psychological Treatment	Yes	3.40 (0.51)	0.00	0.996
	No	3.14 (0.51)		
Other Disease	Yes	3.44 (0.52)	0.00	0.944
	No	3.36 (0.52)		

[a] standard deviation

[b] acute myeloid leukemia, [c] acute lymphoblastic leukemia

[d] chronic myelogenous leukemia, [e] chronic lymphocytic leukemia

[f] myelodysplastic syndrome

[g] bone marrow transplantation

[h] no(have not experienced), [i] yes(have experienced)

3. Correlations between Uncertainty, Perceived Social Support, Posttraumatic Stress Symptoms and Psychological Growth

A significant positive correlation was noted between uncertainty and PTSS, r =0.486, p <0.000. A significant positive correlation was also found between perceived social support and psychological growth, r = 0.413, p <0.000. A significant negative correlation was found between uncertainty and social support, r = -0.383, p <0.000. Significant negative correlation was also found between uncertainty and psychological growth, r = -0.254, p <0.001. Significant negative correlation was also found between social support and PTSS, r = -0.441, p <0.000 and PTSS also had a negative correlation with psychological growth, r = -0.295, p <0.000 (Table 13).

Table 13. Correlations between Uncertainty, Perceived Social Support, Posttraumatic Stress Symptoms and Psychological Growth

Variables	Uncertainty	PSS[a]	PTSS[b]	PG[c]
		r (p)		
Uncertainty		-0.383	0.486	-0.254
		(<0.000)*	(<0.000)*	(<0.001)*
PSS			-0.441	0.413
			(<0.000)*	(<0.000)*
PTSS				-0.295
				(<0.000)*

* coefficients significant at p<.05

[a] perceived social support, [b] posttraumatic stress symptoms , [c] psychological growth

4. Factors influencing Posttraumatic Stress Symptoms

A Stepwise multiple regression was performed using uncertainty and perceived social support to predict posttraumatic stress symptoms. In the first step, uncertainty was entered and predicted 23.6% of the variance of the PTSS scores. Perceived social support entered the second step and predicted 7.6% of additional variance of PTSS. Together these two variables predicted 31.2% of the variance of PTSS. Coefficients from the second step of the regression model indicated that increased uncertainty was associated with higher levels of PTSS and decreased perceived social support was associated with higher levels of PTSS (Table 14).

Table 14. Stepwise Multiple Regression Analysis for Posttraumatic Stress Symptoms

Variables	Posttraumatic Stress Symptoms						
	B	SE	β	t	p	Tolerance	VIF
(constant)	2.473	.446		5.542	.000		
Uncertainty	.496	.094	.372	5.290	.000	.853	1.172
PSS[a]	-.314	.074	-.298	-4.237	.000	.853	1.172
R square	.312						
Adjusted R square	.304						
F-value	36.994				<.000		
Durbin-Watson	2.287						

[a] perceived social support

Note. Uncertainty, perceived social support, age and education were analyzed as independent variables. Uncertainty and perceived social support were selected by stepwise method

5. Factors influencing Psychological Growth

A Stepwise multiple regression was performed using perceived social support, economic status, bone marrow transplantation or relapse, and psychological treatment to predict psychological growth. In the first step, perceived social support was entered and predicted 17.1% of the variance of the psychological growth. Bone marrow transplantation or relapse predicted 2.0%, psychological treatment predicted 2.1%, economic status predicted 1.9% of the additional variance of psychological growth. Together these four variables predicted 23.1% of the variance of psychological growth (Table 15).

Table 15. Stepwise Multiple Regression Analysis for Psychological Growth

Variables	Psychological Growth						
	B	SE	β	t	p	Tolerance	VIF
(constant)	2.743	.311		8.808	.000		
PSS[a]	.274	.048	.395	5.676	.000	.987	1.013
BMT & Relapse	.089	.040	.154	2.227	.027	.998	1.002
Psychological Treatment	-.278	.130	-.148	-2.137	.034	.996	1.004
Economic status	-.149	.074	-.140	-2.004	.047	.985	1.015
R square	.231						
Adjusted R square	.212						
F-value	12.072				<.000		
Durbin-Watson	1.920						

[a] perceived social support

Note. Uncertainty, perceived social support, economic status, bone marrow transplantation or relapse and psychological treatment were analyzed as independent variables. Uncertainty was excluded by stepwise method

CHAPTER VI. DISCUSSION

The findings of the study provide a description of the relationship between uncertainty, perceived social support, posttraumatic stress symptoms and psychological growth in Korean patients with hematologic cancers. Uncertainty, social support, PTSS and psychological growth in patients with hematologic cancers were shown to have a significant correlation, to support the theoretical model proposed in this study.

In the present study, the mean score of uncertainty in patients with hematologic cancers were 61.06±13.64, the average score for each item was 2.65±0.59. Other study done by Kim (2008) with breast cancer survivors in Korea using the same scale, the average score for each item of uncertainty was 1.87 (Kim, 2008). Patients with hematologic cancers showed similar levels of uncertainty compared to patients with different types of cancer. Due to the special characteristics of the disease, patients are not given the time to be prepared for their treatment. As soon as the patient is diagnosed with hematologic cancer, most of the patients are admitted in the hospital and treated as soon as possible. Even after the treatment, patients continuously visit the hospital, which may increase their level of uncertainty than other disease.

In this study, participant's age was significantly associated with uncertainty level. Older participants had higher levels of uncertainty in illness. As Mishel (1983) indicated that education level might influence uncertainty, this study showed the same results. Participants with higher levels of education had lower levels of uncertainty. However, there is conflicting evidence in other previous

study, stating that education is not significantly associated with the levels of uncertainty in adult cancer patient (Porter et al., 2006; Wonghongkul, Moore, Musil, Schneider, & Deimling, 2000). Even though education is a resource assisting patients to explain and assign meaning to illness-related situations (Mishel, 1998), more research is needed to clarify how education functions as a structure provider to decrease illness-related uncertainty in patients with cancer. Longer the patient live with cancer, they felt higher levels of uncertainty. Patients who had other disease besides the hematologic cancer had higher levels of uncertainty. Patients who received bone marrow transplantation and experienced relapse had lower levels of uncertainty than patients who did not received bone marrow transplantation and experienced relapse of their disease.

Patients who did not experience relapse of their disease and admitted in the hospital had lower levels of uncertainty than patients who experienced relapse and was not admitted in the hospital. Patient who experienced relapse and was not admitted in the hospital had higher levels of uncertainty than patients who did not experience relapse nor admitted in the hospital. This showed that patients who experienced relapse had higher levels of uncertainty regardless of the patient's hospital admission.

In this study, higher uncertainty was associated with more PTSS, to support the re-conceptualization of Uncertainty in Illness theory (Mishel, 1990). This relationship could be explained from the perspective of re-conceptualization of Uncertainty in Illness Theory; people with chronic uncertainty in illness may adopt PTSS as a way to manage their uncertainty when they lack sufficient resources for

coping with the challenges of survivorship (Mishel, 1990).

The mean score of perceived social support in hematologic cancer patient were 42.79±8.10 and the average score for each item was 3.82±0.75. Compared to a study done with a sample of Korean patients with breast cancer (mean score: 43.82 ±7.56), it showed slightly lower levels of social support. This could be that the patients with hematologic cancers are isolated due to their extremely low immune system, which limits the visitors while they are in the hospital. PTSS in patient with hematologic cancers can be reduced through reducing their uncertainty by providing information about the occurrence and severity of late effects, clarifying their ambiguity about their illness state, decreasing the complexity of the health care system, and increasing their ability to exert some control over the unpredictability of their life in terms of its quality in the future and their level of function.

Social support was also significantly positively associated with the level of education. Participants with higher degree of education had higher level of social support. Participants who were diagnosed with Acute Myeloid Leukemia and Acute Lymphoblastic Leukemia had higher levels of social support than participants diagnosed with Chronic Myelogenous Leukemia and Chronic Lymphocytic Leukemia. This might be related to their survival time. As soon as the participants are diagnosed with their disease, family and friends may give their full attention, however, as time pass with longer survival time, the attention from support sources may be dispersed. This explains why the higher levels of perceived social with participants diagnosed within 3 months than participants diagnosed more than 3

years.

In the present study, more perceived social support was associated with lower uncertainty. The research finding is consistent with Mishel's (1988) Uncertainty in Illness Theory. Social support can directly influence uncertainty by providing information by decreasing ambiguity, complexity, or unpredictability of illness-related situations (Mishel, 1983, 1988).

The research findings showed that participants' perceived social support had a significant influence on psychological growth and posttraumatic stress symptoms. More social support with higher levels of psychological growth and lower levels of posttraumatic stress symptoms.

In this study, PTSS was predicted 33.3% with the variables of uncertainty, social support and education level. And psychological growth was predicted 23.1% with the variables of social support, whether the participant received bone marrow transplantation or experienced relapse of their disease, if the participant received psychological treatment, and economic status. The variable that most affected a posttraumatic stress symptom was uncertainty and the variable that most affected a psychological growth was perceived social support. Since, the Mishel's Uncertainty in Illness Scale – Community (MUIS-C) and Growth through Uncertainty Scale (GTUS) was not a measure specifically designed to measure uncertainty in patients with cancer, more research is needed. With more specific scale, the prediction could be higher for PTSS and psychological growth.

This study is meaningful since it did not just measure PTSS

which could be shown was a negative outcome, but also measured the positive outcome, psychological growth in patients with cancer. Recently in Korea, PTSS due to trauma has unfortunately been a big issue since the Sewol Ferry disaster in April, 2014. The psychological growth trough trauma should be highlighted for the survivors and a close monitoring should be done. Hopefully, the PCL-C, GTUS scale that has been translated and back-translated to verify the validity through the process of this study could be a useful source to help the survivors of Sewol Ferry survivors, future patients with cancer and other trauma experienced group of people.

Based on these results, interventions that are intended to decrease posttraumatic stress symptoms and to increase psychological growth in patients with hematologic cancers, possibly targeting uncertainty and social support are needed. Although there are no known psychosocial interventions developed specifically for patients with hematologic cancers, evidence-based offerings could be developed to meet the special needs of this population. The Managing Uncertainty Day-to Day intervention is designed to help older breast cancer survivors manage fears of recurrence and improve coping skills by delivering cognitive strategies via audiotape (Mishel, 2005). Supportive-expressive group therapy intervention also has been shown to significantly reduce trauma symptoms and mood disturbance in women with advanced breast cancer (Classen, 2001). These treatments exist for other types of cancer and these interventions may be beneficial for the patients with hematologic cancers PTSS and psychological growth.

There were several limitations in the present study. First,

although the instruments used in the study generally demonstrated acceptable reliability coefficients. The convenience sample of Korean patients with hematologic cancers contained an overrepresentation of married male, which may not be representative of patients with hematologic cancers throughout Korea. The likelihood of sampling bias possibly could skew participants' scores on the variables. Therefore, results should not be generalized beyond the study sample.

With regard to sampling, the sample size was sufficient to gain enough power. However, the participants were not chosen from a random sample. All patients who participated in this study were recruited from Seoul National University Hospital, a major medical center in Seoul, Korea. The non-random selection of participants may affect the sample's representation of the total population thus limiting the generalizability of the research findings. In addition, patients who refused to participate in the study might have had unknown characteristics that could have influenced the study results.

Another limitation of the research design was that it study was a cross-sectional study. The cross-sectional design does not allow for definitive explanation of casual relationships. Successful adaptation to a serious chronic illness is a process changing over time. Because the cancer experience is a learning process, longitudinal study is recommended for best study results.

CHAPTER VII. CONCLUSION

In this study patient with hematologic cancers' uncertainty were significantly associated with posttraumatic stress symptoms and significantly negatively associated with perceived social support and psychological growth. This result is the same as what has been explained in the re-conceptualized Mishel's Uncertainty in Illness Theory.

Significant correlations were identified among all four variables. As a result of multiple regression analysis, uncertainty and perceived social support were discovered to account for 31.2% of the variance in posttraumatic stress symptoms. Perceived social support, bone marrow transplantation or relapse, psychological treatment, and economic status were discovered to account for 23.1% of the variance in psychological growth. The variable that most affected a posttraumatic stress symptom was uncertainty and the variable that most affected a psychological growth was perceived social support.

There is not much literature on uncertainty, perceived social support, PTSS and psychological growth for cancer, especially in patients with hematologic cancers and Korean patients with cancer. More attention should be paid toward elaborating the view of uncertainty as a key element in the relationship between symptoms of PTSS and psychological growth in the future.

Findings from the current study can enrich knowledge in nursing education about applying the Uncertainty in Illness Theory and its Reconceptualization (Mishel, 1988; 1990) in nursing care of hematologic patients and potentially for patients with other cancer.

Nurses who work with patients with hematologic cancers should develop an awareness of the uncertainty that permeates patient's experience and that could develop to posttraumatic stress symptoms. Hematology unit nurses should be able to identify high-risk patients and intervene.

Directions for Future Research

It is clear that more research on posttraumatic stress symptoms and psychological growth in patients with hematologic cancers are needed. This study is considered as an initial step in understanding the positive and negative psychological outcomes of living with continuous uncertainty about their disease.

This study was a cross-sectional study so, future research employing a longitudinal design may be the best attempt to overcome the limitations of recall bias and casual ordering, In addition, qualitative interview are likely to provide a more rich understanding of patients with hematologic cancer uncertainty, social support, posttraumatic stress symptoms and psychological growth. Further research should be done on the development and testing of early intervention programs targeted for hematologic cancer patients.

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APPENDICES

APPENDIX A: Informed Consent

APPENDIX B: Demographic Information

APPENDIX C: Mishel's Uncertainty in Illness Scale – Community Form

APPENDIX D: Multidimensional Scale of Perceived Social Support

APPENDIX E: PTSD Checklist – Civilian version

APPENDIX F: Growth through Uncertainty Scale

APPENDIX G: Confirmation of IRB Approval

APPENDIX H: Permission to use the instruments

APPENDIX A: Informed Consent

안녕하십니까?

저는 서울대학교 간호대학 석사과정에 재학 중인 김지연입니다.

본 설문지는 병동이나 외래에서 혈액암으로 치료받는 환자들이 지각하는 불확실성, 사회적 지지와 외상 후 스트레스의 정도를 파악하여 보다 나은 간호서비스를 제공하고자 조사하는 것입니다.

귀하께서 응답해주신 내용은 순수하게 연구 목적으로만 이용될 것이고, 무기명으로 처리되며 일체의 사항은 비밀이 유지됨을 약속 드립니다.

귀하의 솔직하고 성의 있는 답변 부탁 드립니다.

힘들고 불편하신 와중에도 귀한 시간 내어주시고 응답에 참여해 주셔서 진심으로 감사 드립니다.

연구자: 김지연 (서울대학교 간호대학 대학원 석사과정생)
소속: 서울대학교병원

연구 참여 동의서

연구 제목: 혈액암 환자의 불확실성, 사회적 지지, 외상 후 스트레스 증상과 성장

본 연구는 혈액암으로 진단받은 환자가 지각하는 불확실성, 사회적 지지, 외상 후 스트레스 증상과 성장을 파악하기 위해 마련된 것입니다. 설문지의 문제들은 정답이 없으며 여러분이 가지고 있는 생각 그대로 문항에 답해 주시면 됩니다.

설문지는 작성하는데 총 15~20분 정도 소요됩니다. 또한, 설문지를 작성하시는 도중에라도 더 작성을 원하지 않으실 경우에는 언제든지 그만 두실 수 있습니다.

제공해주신 모든 자료와 정보는 무기명으로 처리되며, 전체 대상자에 대한 결과로서 제시되고 개별적으로는 제시되지 않으므로 일체의 사항은 비밀이 보장되어, 귀하에게 어떠한 불이익도 발생하지 않을 것입니다. 또한 제공해주신 정보는 본 연구목적으로만 사용될 것이며, 이외의 용도로는 사용되지 않을 것입니다.

귀하의 답해주신 내용을 통해 혈액암으로 치료 받는 환자들의 불확실성과 외상 후 스트레스 증상들을 파악하여, 보다 나은 간호서비스를 제공하는데 도움이 될 것입니다.

연구와 관련하여 의문사항이 있으실 경우, 언제든지 아래의 연락처로 문의하시기 바랍니다.

연구자: 김지연(서울대학교 간호대학 대학원 석사과정생)
소속: 서울대학교병원

본인은 이 연구에 대하여 대한 설명을 충분히 들었으며, 이 연구에 참여할 것을 동의합니다. 본인은 자발적으로 이 연구에 참여하고 있음을 알고 있습니다.

날짜: 2014년 월 일
성명: (서명)

APPENDIX B: Demographic Information

ID #:

1. Age: ( )
2. Gender: Male( ), Female( )
3. Education : below middle school( ), high school( ), college( ), above college( )
4. Employment: Full time job( ), Part-time job( ), Not employed( )
5. Marital status: Single( ), Married( ), Widowed( ), Divorced( )
6. Economic status: High( ), Middle( ), Low( )
7. Religion: Yes( ), No( )
8. Type of cancer:

   AML( ), CML( ), ALL( ), CLL( ), MDS( )

   Non-Hodgkin's lymphoma( ), Hodgkin's lymphoma( )
9. Time since diagnosis: ( ) years ( ) months
10. Time since treatment: ( ) years ( ) months
11. Type of treatment undergone:

    Chemotherapy( ), Radiation( ),

    Bone marrow transplantation(allo( ), auto( )), Target therapy( )
12. Have you experienced recur or relapse? Yes( ), No( )
13. Are you admitted in the hospital right now? Yes( ), No( )
14. History of treatment for psychiatric disorder:

    Yes( ), No( ) if yes, what is it? _____
15. Any other medical condition? Yes( ) No( ) if yes, what is it? _____
16. Is there a cancer patient in your family?

    Yes( ), No( ) if yes, who is it and what type of cancer is it?_____

일반적 특성관련 설문지

ID #:

1) 나이: ( )

2) 성별: 남자( ), 여자( )

3) 교육정도 : 중졸이하( ), 고졸( ),대졸( ),대학원이상( )

4) 직업: 정규직( ), 계약직( ), 무직( )

5) 결혼상태: 미혼( ), 기혼( ), 사별( ), 이혼( )

6) 경제상태: 상( ), 중( ), 하( )

7) 종교: 있다( ), 없다( )

8) 진단받은 혈액암의 종류:

AML( ), CML( ), ALL( ), CLL( ), MDS( )

Non-Hodgkin's lymphoma( ), Hodgkin's lymphoma( )

9) 혈액암을 진단 받은 지 얼마나 되었습니까? ( )년 ( )개월

10) 혈액암 치료를 받기 시작한지 얼마나 되었습니까? ( )년 ( )개월

11) 어떠한 혈액암 치료를 받으셨습니까?

항암제 치료( ), 방사선 치료( )

조혈모세포 이식(동종( ), 자가( )), 표적치료제( )

12) 혈액암이 재발된 적이 있습니까? 예( ), 아니요( )

13) 현재 병원에 입원 중이십니까? 예( ), 아니요( )

14) 정신과 진단을 받거나 치료를 받은 적이 있습니까? 없다( ), 있다( )

있다면, 어떤 진단을 받고 치료 받으셨습니까?_____

15) 앓고 있는 다른 질병이 있습니까? 예( ), 아니요( )

있다면, 무엇입니까? _____

16) 가족 중 암환자가 있습니까? 예( ), 아니요( )

있다면, 누가 어떤 암에 걸렸습니까? _____

APPENDIX C: Mishel's Uncertainty in Illness Scale – Community Form

Please read each statement. Take your time about what each statement says. Then place an O on the column that mostly closely measures how you are feel.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I don't know what is wrong with me.	1	2	3	4	5
2. I have a lot of questions without answers.	1	2	3	4	5
3. I am unsure if my illness is getting better or worse.	1	2	3	4	5
4. It is unclear how bad my plan will be.	1	2	3	4	5
5. The explanations they give about my condition seem hazy to me.	1	2	3	4	5
6. The purpose of each treatment is clear to me.	1	2	3	4	5
7. My symptoms continue to change unpredictably.	1	2	3	4	5
8. I understand everything explained to me.	1	2	3	4	5
9. The doctors say things to me that could have many meanings.	1	2	3	4	5
10. My treatment is too complex to figure out.	1	2	3	4	5
11. It is difficult to know if the treatments or medications I am getting are helping.	1	2	3	4	5
12. Because of the unpredictability of my illness, I cannot plan for the future.	1	2	3	4	5
13. The course of my illness keeps changing. I have good and bad days.	1	2	3	4	5
14. I have been given many differing opinions about what is wrong with me.	1	2	3	4	5
15. It is not clear what is going to happen to me.	1	2	3	4	5
16. The results of my tests are inconsistent.	1	2	3	4	5
17. The effectiveness of the treatment is undetermined.	1	2	3	4	5
18. Because of the treatment, what I can do and cannot do keeps changing.	1	2	3	4	5
19. I'm certain they will not find anything else wrong with me.	1	2	3	4	5
20. The treatment I am receiving has a known probability of success.	1	2	3	4	5
21. They have not given me a specific diagnosis.	1	2	3	4	5
22. The seriousness of my illness has been determined.	1	2	3	4	5
23. The doctors and nurses use everyday language so I can understand what they are saying.	1	2	3	4	5

불확실성 척도 (Mishel uncertainty in illness scale – Community form)

다음은 귀하께서 질병이나 치료 진행 과정에 대해 어떻게 생각하시는지에 대해 알고자 하는 것입니다. 귀하가 현재 어떻게 생각하는지 해당란에 "O"를 표시해 주십시오.

	전혀그렇지않다	거의그렇지않다	보통이다	약간그렇다	매우그렇다
1. 내 상태가 얼마나 나쁜지 모르겠다.	1	2	3	4	5
1. 나는 궁금한 것이 많다.	1	2	3	4	5
2. 내가 더 좋아질지, 나빠질지 확신이 없다.	1	2	3	4	5
3. 앞으로의 치료계획이 얼마나 나쁠지 알 수 없다.	1	2	3	4	5
4. 나는 의료진이 내 병에 대해 설명한 것을 이해하지 못한다.	1	2	3	4	5
5. 나는 내가 왜 이 치료를 받는지 알고 있다.	1	2	3	4	5
6. 내 증상들은 계속해서 바뀐다.	1	2	3	4	5
7. 나는 설명들은 내용을 모두 이해한다.	1	2	3	4	5
8. 의사들이 내게 설명한 것들은 혼란스럽다.	1	2	3	4	5
9. 내가 받는 치료는 이해하기가 너무 어렵다.	1	2	3	4	5
10. 내가 받는 치료나 약물이 나에게 효과가 있을지 없을지 모르겠다.	1	2	3	4	5
11. 내 상태가 계속 변하므로 앞날을 계획할 수 없다.	1	2	3	4	5
12. 내 병의 경과가 계속 바뀌므로 좋은 날도 있고 안 좋은 날도 있다.	1	2	3	4	5
13. 내 문제에 대해 의료진들이 서로 다른 이야기를 한다.	1	2	3	4	5
14. 앞으로 내게 무슨 일이 생길지 확실치 않다.	1	2	3	4	5
15. 검사에 따라 검사 결과가 다르다.	1	2	3	4	5
16. 내가 받는 치료가 효과가 있을지 모르겠다.	1	2	3	4	5
17. 치료 때문에 내가 할 수 있는 일들이 계속 달라진다.	1	2	3	4	5
18. 의료진들은 내 병에 대해 더 이상 나쁜 것을 찾지 못할 것이다.	1	2	3	4	5
19. 내가 받는 치료는 전에 다른 사람들에게 효과가 있었던 치료이다.	1	2	3	4	5
20. 의료진은 나에게 정확한 진단명을 말해주지 않았다.	1	2	3	4	5
21. 나는 내 병이 어느 정도 심각한지 안다.	1	2	3	4	5
22. 나는 의사와 간호사들이 쓰는 용어를 이해할 수 있다.	1	2	3	4	5

APPENDIX D: Multidimensional Scale of Perceived Social Support

Please read each statement. Take your time about what each statement says. Then place an O on the column that mostly closely measures how you are feeling.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. There is a special person who is around when I am in need.	1	2	3	4	5
2. There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5
3. My family really tries to help me.	1	2	3	4	5
4. I get the emotional help and support I need from my family.	1	2	3	4	5
5. I have a special person who is a real source of comfort to me.	1	2	3	4	5
6. My friends really try to help me.	1	2	3	4	5
7. I can count on my friends when things go wrong.	1	2	3	4	5
8. I can talk about my problems with my family	1	2	3	4	5
9. I have friends with whom I can share my joys and sorrows.	1	2	3	4	5
10. There is a special person in my life who cares about my feelings.	1	2	3	4	5
11. My family is willing to help me make decisions.	1	2	3	4	5
12. I can talk about my problems with my friends.	1	2	3	4	5

사회적 지지 척도 (Multidimensional Scale of Perceived Social Support)

다음의 문장들은 귀하가 느끼시는 사회적 지지에 대한 설문입니다.
각 문장을 주의 깊게 읽으시고 동의하시는 번호에 O 표시해주시기 바랍니다.

	전혀그렇지않다	거의그렇지않다	보통이다	약간그렇다	매우그렇다
1. 내 주위에는 내가 어려울 때 나를 도와 줄 특별한 사람 (의사, 간호사)이 있다.	1	2	3	4	5
2. 나에게는 나의 슬픔과 기쁨을 함께 나눌 특별한 사람 (의사, 간호사)이 있다.	1	2	3	4	5
3. 나의 가족들은 나에게 도움을 주고자 진정으로 노력한다.	1	2	3	4	5
4. 나는 내가 필요로 하는 정서적 도움과 지지를 가족들로부터 얻는다.	1	2	3	4	5
5. 나에게는 나를 진정으로 위로해 줄 특별한 사람 (의사, 간호사)이 있다.	1	2	3	4	5
6. 나의 친구들은 나에게 도움을 주고자 진정으로 노력한다.	1	2	3	4	5
7. 어떤 일들이 잘못되었을 때 나는 나의 친구에게 의지할 수 있다.	1	2	3	4	5
8. 나는 나의 문제들에 대해 가족들과 이야기를 나눌 수 있다.	1	2	3	4	5
9. 나는 나의 슬픔과 기쁨을 함께 나눌 친구들이 있다.	1	2	3	4	5
10. 내 인생에는 나의 감정을 보살펴 주는 특별한 사람 (의사, 간호사)이 있다.	1	2	3	4	5
11. 나의 가족들은 내가 어떤 일을 결정할 때 기꺼이 도움을 주려고 한다	1	2	3	4	5
12. 나는 나의 문제에 대하여 친구들과 이야기를 나눌 수 있다.	1	2	3	4	5

APPENDIX E: PTSD Checklist – Civilian version

Instructions: Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem.

	Not at all	A Little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?	1	2	3	4	5
2. Repeated, disturbing dreams of a stressful experience from the past?	1	2	3	4	5
3. Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?	1	2	3	4	5
4. Feeling very upset when something reminded you of a stressful experience from the past?	1	2	3	4	5
5. Having physical reactions (e.g. heart pounding, trouble breathing, or sweating) when something reminded you of a stressful experience from the past?	1	2	3	4	5
6. Avoid thinking about or talking about a stressful experience from the past or avoid having feelings related to it?	1	2	3	4	5
7. Avoid activities or situations because they remind you of a stressful experience from the past?	1	2	3	4	5
8. Trouble remembering important parts of a stressful experience from the past?	1	2	3	4	5
9. Loss of interest in things that you used to enjoy?	1	2	3	4	5
10. Feeling distant or cut off from other people?	1	2	3	4	5
11. Feeling emotionally numb or being unable to have loving feelings for those close to you?	1	2	3	4	5
12. Feeling as if your future will somehow be cut short?	1	2	3	4	5
13. Trouble falling or staying asleep?	1	2	3	4	5
14. Feeling irritable or having angry outbursts?	1	2	3	4	5
15. Having difficulty concentrating?	1	2	3	4	5
16. Being “super alert” or watchful on guard?	1	2	3	4	5
17. Feeling jumpy or easily startled?	1	2	3	4	5

PCL-C (Korean Version)

다음의 문장들은 귀하가 느끼시는 외상 후 스트레스에 대한 설문입니다.
각 문장을 주의 깊게 읽으시고 동의하시는 번호에 O 표시해주시기 바랍니다.

	전혀 그렇지않다	거의그렇지않다	보통이다	약간그렇다	매우그렇다
1. 과거의 스트레스적인 경험으로 인해 반복적으로 방해되는 기억과 생각 또는 이미지가 떠오르나요?	1	2	3	4	5
2. 과거의 스트레스적인 경험으로 인해 반복적으로 수면을 방해합니까?	1	2	3	4	5
3. 스트레스적인 경험이 다시 발생하거나 일어날 것 같은 느낌을 느낍니까?	1	2	3	4	5
4. 무언가로 인해 스트레스적인 경험을 상기시킨다면 매우 불편감을 느낍니까?	1	2	3	4	5
5. 무언가로 인해 스트레스적인 경험을 상기시켰을 때 신체적 반응(두근거림, 호흡곤란, 식은땀)을 경험한 적이 있습니까?	1	2	3	4	5
6. 스트레스적인 경험과 그와 관련된 감정에 대해 생각하거나 대화를 피하십니까?	1	2	3	4	5
7. 어떤 활동이나 상황이 스트레스적인 경험을 상기시킨다면 피하시겠습니까?	1	2	3	4	5
8. 스트레스적인 경험의 중요한 부분을 기억하는데 어려움이 있습니까?	1	2	3	4	5
9. 당신이 평소 즐기는 것들에 대해 흥미를 잃으셨나요?	1	2	3	4	5
10. 타인과 연락을 하지 않거나 거리를 둔다고 느끼십니까?	1	2	3	4	5
11. 당신과 가까운 사람에 대해 사랑을 느끼기 어렵거나 감정적으로 무감각함을 느낍니까?	1	2	3	4	5
12. 왠지 당신의 미래가 갑작스럽게 끝날 것 같습니까?	1	2	3	4	5
13. 잠을 자거나 잠이 들기까지 어려움을 느끼십니까?	1	2	3	4	5
14. 짜증을 내거나 갑작스럽게 화가 나십니까?	1	2	3	4	5
15. 무언가에 집중하는데 어려움을 느낍니까?	1	2	3	4	5
16. 주변을 경계하거나 예민함을 느낍니까?	1	2	3	4	5
17. 쉽게 놀라거나 조마조마함을 느낍니까?	1	2	3	4	5

APPENDIX F: Growth Through Uncertainty Scale

	No at all	A Lit le bit	Mo der ate y	Qu te a bit	Ext rem ely
1. My situation has opened new possibilities for me	1	2	3	4	5
2. I greet each day with more joy.	1	2	3	4	5
3. I fear the unexpected more now.	1	2	3	4	5
4. My dreams are clearer to me now.	1	2	3	4	5
5. I focus more now on what is important in life.	1	2	3	4	5
6. My life has new meaning.	1	2	3	4	5
7. I am more able to “go with the flow.”	1	2	3	4	5
8. I now view change in my life as more of a threat.	1	2	3	4	5
9. My priorities have now changed.	1	2	3	4	5
10. I have structured a new way of living.	1	2	3	4	5
11. I have a new perspective on life	1	2	3	4	5
12. I now greet surprises with more joy.	1	2	3	4	5
13. I see new opportunities in my everyday routine.	1	2	3	4	5
14. I have a new sense of what is important.	1	2	3	4	5
15. My views about how to do things have broadened.	1	2	3	4	5
16. I now consider many different alternatives.	1	2	3	4	5
17. I am more comfortable with taking changes as they come.	1	2	3	4	5
18. I am more aware of what is important to me.	1	2	3	4	5
19. My relationships with others have new meaning.	1	2	3	4	5
20. I am now more likely to do things because I want to do them.	1	2	3	4	5
21. Some activities that I used to do don’t seem so important now.	1	2	3	4	5
22. My future goals are now more flexible.	1	2	3	4	5
23. I am now more afraid of how I will end up.	1	2	3	4	5
24. When thinking about my future, I now try to be more flexible.	1	2	3	4	5
25. It is more important to me now to try to make the best of each situation.	1	2	3	4	5
26. I now try to challenge myself more.	1	2	3	4	5
27. Things I have taken for granted before now take on a new meaning.	1	2	3	4	5
28. The uncertainty of my child’s illness is now the greatest worry I have to deal with.	1	2	3	4	5
29. I don’t plan for the future now as much as I did before my	1	2	3	4	5

illness.					
30. I create new rules and expectations for my life.	1	2	3	4	5
31. I am now learning about letting go of control.	1	2	3	4	5
32. I now respect the future more as an unknown.	1	2	3	4	5
33. I don't worry as much about what could happen tomorrow.	1	2	3	4	5
34. Now I don't get as upset at the little things.	1	2	3	4	5
35. I don't put things off until later as much as I did before.	1	2	3	4	5
36. Now I have learned to adapt to the unexpected.	1	2	3	4	5
37. I now accept change and unpredictability more as a positive way of life.	1	2	3	4	5
38. My values have changed.	1	2	3	4	5
39. I don't expect life to be as predictable as I did before.	1	2	3	4	5

Growth Through Uncertainty Scale (GTUS) Korean Version

다음의 문장들은 귀하의 불확실성을 통한 성장에 대한 설문입니다.
각 문장을 주의 깊게 읽으시고 동의하시는 번호에 O 표시해주시기 바랍니다.

	전혀그렇지않다	거의그렇지않다	보통이다	약간그렇다	매우그렇다
1. 지금 상황은 나에게 새로운 가능성으로 열려있다.	1	2	3	4	5
2. 나는 매일 하루를 즐겁게 맞이한다.	1	2	3	4	5
3. 나는 지금보다 예측할 수 없는 미래가 두렵다	1	2	3	4	5
4. 현재 내 꿈이 더욱 확실해졌다.	1	2	3	4	5
5. 나는 현재 내 인생에 중요한 것들을 집중할 수 있다.	1	2	3	4	5
6. 나는 내 인생의 새로운 의미를 가진다.	1	2	3	4	5
7. 나는 좀 더 대세에 순응할 수 있다.	1	2	3	4	5
8. 나는 내 인생의 위협에 대해 관점이 변했다.	1	2	3	4	5
9. 나의 우선순위가 현재 바뀠다.	1	2	3	4	5
10. 나는 새로운 삶의 방식을 건설했다.	1	2	3	4	5
11. 나는 내 인생에 대해 새로운 관점을 가졌다.	1	2	3	4	5
12. 나는 현재 즐거움으로 예상치 못한 상황을 맞이할 수 있다.	1	2	3	4	5
13. 나는 매일 일상적인 하루를 새로운 기회로 본다.	1	2	3	4	5
14. 나는 무엇이 중요한지를 알 수 있는 새로운 감각을 가졌다.	1	2	3	4	5
15. 사물에 대한 나의 관점은 넓어졌다.	1	2	3	4	5
16 나는 현재 다양한 대안 책들을 고려한다.	1	2	3	4	5
17. 나는 앞으로 올 수 있는 변화를 좀 더 편안하게 받아들일 수 있다.	1	2	3	4	5
18. 나는 나에게 중요한 것을 더 잘 안다.	1	2	3	4	5
19. 타인과의 관계에서 좀 더 새로운 의미를 가진다.	1	2	3	4	5
20. 현재 나는 내가 원하는 것들이기 때문에 할 수 있을 것 같다.	1	2	3	4	5
21. 나는 과거에 했던 몇몇 활동들이 현재는 중요하지 않다고 본다.	1	2	3	4	5
22. 나의 미래 목표는 좀 더 유연성 있다.	1	2	3	4	5
23. 나는 현재 내가 어떻게 끝내게 될지 두렵다.	1	2	3	4	5
24. 내 미래에 대해 생각할 때 현재 나는 좀 더 유연성 있도록 노력한다.	1	2	3	4	5
25. 나는 현재 각각 최선의 상황을 만들 수 있도록 노력하는 것이 좀 더 중요하다.	1	2	3	4	5
26. 나는 내 스스로 좀더 도전적으로 노력하고자 한다.	1	2	3	4	5
27. 예전에 나에게 주어진 것들을 현재 새로운 의미로 받아들인다.	1	2	3	4	5
28. 내 어린 시절 질병에 대한 불확실성은 지금 내가 다뤄야 할 가장 큰 고민이다.	1	2	3	4	5

29. 나는 질환을 얻기 전 만큼 미래에 대한 계획이 없다.	1	2	3	4	5
30. 나는 내 인생을 위한 기대와 새로운 규칙들을 만들었다.	1	2	3	4	5
31. 현재 나는 통제를 내버려두는 것에 대해 배운다.	1	2	3	4	5
32. 나는 현재 앞으로 알지 못하는 미래를 존중한다.	1	2	3	4	5
33. 나는 내일 일어날 수 있는 것들에 대해 가능한 걱정하지 않는다.	1	2	3	4	5
34. 나는 현재 작은 일에 대해 흥분하지 않는다.	1	2	3	4	5
35. 나는 예전만큼 뒤로 미루지 않는다.	1	2	3	4	5
36. 현재 나는 기대하지 못한 것에 대해 적응하는 것을 배웠다.	1	2	3	4	5
37. 현재 나는 변화와 예측할 수 없는 것들을 좀더 긍정적인 삶의 방향으로 받아들인다.	1	2	3	4	5
38. 나의 가치는 변했다.	1	2	3	4	5
39. 나는 예전처럼 삶을 예측할 수 있길 기대하지 않는다.	1	2	3	4	5

APPENDIX G: CONFIRMATION OF IRB APPROVAL

서울대학교의과대학/서울대학교병원
의학연구윤리심의위원회

IRB SNUCM SNUH

서울대학교의과대학/서울대학교병원 의학연구윤리심의위원회	
Tel : 82-02-2072-0694	
FAX : 82-02-2072-0868	서울특별시 종로구 대학로 101번지 (우)110-744

심의결과통보서

IRB No.	H-1406-031-584			제출경로	서울대병원		
수신	책임연구자	김지연		소속	간호본부	직위	간호직
	의뢰기관						
연구과제명	혈액암 환자의 불확실성, 사회적지지, 외상후스트레스 증상과 성장						
Protocol No.				Version No.			
생명 윤리법에 따른 분류	■ 인간대상연구 □ 인체유래물연구 □ 배아줄기세포주이용연구 □ 배아연구 □ 체세포복제배아연구 □ 단성생식배아연구 □ 배아생성의료기관 □ 인체유래물은행						
연구종류	■ 임상시험 외 연구	□ 증례보고 □ 생태학적 연구 ■ 단면조사연구 ■ 조사,설문,인터뷰 연구 □ 환자군 연구 □ 환자-대조군연구 □ 인체유래물저장소 연구 □ 등록(레지스트리) 연구 □ 사후후사용성적조사 □ 전향적 코호트 연구 □ 후향적 코호트연구 □ 기타					
	□ 임상시험	연구 대상	□ 의약품 □ 생물학적제제 □ 건강기능식품 □ 의료기기 □ 기타				
			일반명				
			상품명				
		Phase	□ 제1상 □ 제1/2상 □ 제2상 □ 제2/3상 □ 제3상 □ 제4상 □ 생물학적동등성 □ 기타				
		식약처 승인 대상 여부	□ 식약처승인대상 ■ 승인 제외 대상				
		임상시험 목적	□ 학술용 □ 국내(KFDA)허가용 □ 해외 허가용				
연구계획서승인일	2014년 07월 07일 (정기보고주기 : 12개월)						
승인유효기간	2014년 07월 07일 ~ 2015년 07월 06일			심의대상	연구계획심의 의뢰서(수정후신속심의에 대한 답변)		
심의종류	신속심의			심의일자	2014년 07월 06일		
접수일자	2014년 07월 01일			심의결과통보일	2014년 07월 07일		
심의목록	1. 연구계획심의 의뢰서(수정후신속심의에 대한 답변) 2. 연구계획서 3. 연구대상자 설명문 및 동의서						
심의결과	승인						
심의의견	[심의 의견에 대하여 적절히 수정되었고, IRB의 승인 기준에 따라 승인합니다.]						

의 학 연 구 윤 리 심 의 위 원 회 위 원 장

본 통보서에 기재된 사항은 IRB의 기록된 내용과 일치 함을 증명합니다.
본 기관 IRB는 생명윤리 및 안전에 관한 법률, 약사법, 의료기기법 및 ICH-GCP 등 관련 법규를 준수합니다.
본 연구와 이해관계(Conflict of Interest)가 있는 위원이 있을 경우 연구의 심의에서 배제하였습니다.

1/2

서울대학교의과대학/서울대학교병원 의학연구윤리심의위원회
Tel : 82-02-2072-0694
FAX : 82-02-2072-0368 서울특별시 종로구 대학로 101번지 (우)110-744

본 위원회에서 승인된 모든 연구자들은 다음의 사항을 준수하여야 합니다.

1. 연구계획서 및 변경계획서의 승인 이전에 연구대상자의 해당 임상연구 참여 금지됩니다.

2. 승인 받은 계획서에 따라 연구를 수행하여야 합니다. 변경계획서에 대한 승인 이전에 본 임상연구 계획서와 다른 임상연구의 실시가 금지됩니다.

3. IRB 승인 받은 동의서를 사용하여야 합니다.

4. 연구대상자에게 강제 혹은 부당한 영향이 없는 상태에서 충분한 설명에 근거하여 동의과정을 수행할 것이며, 잠재적인 연구대상자에게 연구의 참여여부를 고려할수 있도록 충분한 기회를 제공하여야 합니다.

5. 연구진행에 있어 연구대상자를 보호하기 위해 불가피한 경우를 제외하고 연구의 어떠한 변경이든 위원회의 사전승인을 받고 수행하여야 합니다. 연구대상자들의 보호를 위해 취해진 어떠한 응급상황에서의 변경도 즉각 위원회에 보고하여야 합니다.

6. 연구대상자의 즉각적 위험 요소의 제거가 필요하여 본 계획서와 다르게 연구를 실시 해야하는 경우, 연구대상자에게 발생하는 위험요소를 증가 시키거나 연구의 실시에 중대한 영향을 미칠 수 있는 변경사항, 예상하지 못한 중대한 이상약물/의료기기 반응에 관한 사항, 피험자의 안전성이나 임상연구의 실시에 부정적인 영향을 미칠 수 있는 새로운 정보에 관한 사항은 위원회에 신속히 보고하여야 합니다.

7. 위원회의 승인을 받은 피험자 모집 광고문을 사용해야 합니다.

8. 위원회의 승인은 1년을 초과할 수 없습니다. 1년 이상 연구를 지속하고자 하는 경우에는 반드시 연차지속보고를 하여야하며, 위원회에서 요구한 중간보고주기에 따라 연구 진행과 관련한 보고서를 제출하여야 합니다.

9. 심의결과가 승인이 아닌 경우에는 답변서를 제출하여야 하며, 심의일로부터 6개월 이내에 이루어져야 합니다.

10. 위원회가 연구를 반려하는 경우 이의신청을 할 수 있으며, 같은 사항에 대하여 2번 연속으로 이의 신청은 할 수 없습니다.

11 . 연구종료시에는 종료 및 결과보고서를 제출해야 합니다.

12. 생명윤리 및 안전에 관한 법률, 약사법/의료기기법, 헬싱키 선언 및 ICH-GCP 가이드 라인 등 국내외 관련 법규를 준수하여야 합니다.

13. 헬싱키선언에 따라 모든 임상시험은 첫 피험자를 모집하기 전 공개적으로 접근이 가능한 데이터베이스(primary registry)에 연구에 대하여 공개하여야 하며, 예를 들어 (http://register.clinicaltrials.gov)를 이용하실 수 있습니다.

14. 승인 받은 연구에 대하여 기관의 내부 점검 및 외부의 실태조사를 받을 수 있습니다. 기관의 내부 점검자, 외부의 모니터요원 및 점검자, 규제기관의 실태조사자 등이 연구 관련 문서(전자문서 포함)에 대한 열람을 요청하는 경우 연구담당자는 이에 적극 협조해야 합니다.

APPENDIX H: PERMISSION TO USE THE INSTRUMENTS

The following are the copies of the e-mail to prove the permission to use the instruments in this study.

Request Form: MUIS-Community

I request permission to copy the Uncertainty in Illness Scale-Community for use in my research entitled:
Relationships among uncertainty, perceived social support, posttraumatic stress symptoms and psychological growth in patients with hematologic cancer in Korea

In exchange for this permission, I agree to submit to Dr. Mishel, upon completion of the study, a printout of the uncertainty data and an electronic submission or CD containing the data with the data dictionary. The data must contain information on each subject's age, sex, education, and diagnosis, along with data on each subject's response to each item on the scale. This data will be used to establish a normative database for clinical populations. No other use will be made of the data submitted. Credit will be given to me in reports of normative statistics that make use of the data I submitted for pooled analyses. Credit will be given to me in any reports referring to my findings.

(signature) 8/27/14 (date)

Positions and full address of Investigator: Ji-Yeon Kim, RN, BSN
Graduate Student, Master's Program
College of Nursing, Seoul National University
103 Daehak-ro, Jong no-gu, Seoul, Korea
Email: nemmanger421@gmail.com

Permission is hereby granted to copy the MUIS for use in the research described above.

Merle H. Mishel 9-11-14
Merle H. Mishel Date

Please send two signed copies of this form to: Merle H. Mishel, PhD, FAAN; School of Nursing, CB #7460 Carrington Hall, University of North Carolina, Chapel Hill, NC 27599-7460

2014년 6월 10일

Gmail

2014년 6월 5일 오후 3:12

Dear Mr. Zimet,

My name is Ji-Yeon Kim.

I am a graduate student at Seoul National University, College of Nursing in Seoul, South Korea.
I am planning on studying the relationships among uncertainty, perceived social support, posttraumatic stress symptoms and psychological growth in patients with hematologic cancer in Korea. To measure the perceived social support I was hoping to use the multidimensional scale of perceived social support measurement.
I was not sure where to obtain the permission to use this instrument, and I found your e-mail.
Please let me know if I should reach someone else.

Thank you very much

Sincerely,
Jiyeon Kim

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2014년 6월 6일 오전 1:03

Hello Ji-Yeon Kim,

You have my permission to use the Multidimensional Scale of Perceived Social Support (MSPSS) in your research. I have attached a copy of the scale, which includes scoring information on the second page. Also attached is a document listing articles that have reported on the psychometric characteristics of the scale. Finally, I have attached a copy of the scale translated into Korean language.

I hope your research goes well.

Sincerely yours,

Greg Zimet

2014년 6월 10일

Gmail by Google

PCL-C

2014년 6월 5일 오후 3:07

Dear Ms.Mott,

My name is Ji-Yeon Kim.

I am a graduate student at Seoul National University, College of Nursing in Seoul, South Korea.
I am planning on studying the relationships among uncertainty, perceived social support, posttraumatic stress symptoms and psychological growth in patients with hematologic cancer in Korea. To measure the posttraumatic stress symptoms I was hoping to use the PCL-C measurement.
I was not sure where to obtain the permission to use this instrument, and I foung your e-mail.
Please let me know if I should reach someone else.

Thank you very much

Sincerely,
Jiyeon Kim

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2014년 6월 6일 오전 1:27

Dear Ji-Yeon Kim,

Thank you for your assessment instrument request. All versions of the PCL for DSM-IV and DSM-5 were created by government employees and therefore are not copyrighted. Therefore, they are free for use by qualified health professionals and no permission is necessary. You are also free to translate the measure, if desired.

You may access the measure by Ctrl+Click on: https://downloads.va.gov

Step 1: Click "multiple files" link. If that does not work, go to "single files"

Step 2: Once file browser window opens, double click to open "PTSDinfo" folder.

Step 3: Double click to open "PTSD Assessments".

Step 4: Measures are grouped within folders by type. Select the trauma measure or measures you are looking for within each folder. Refer to the folder listing in the left panel of the screen to access particular

Request Form: GTUS

I request permission to copy the Growth Through Uncertainty Scale for use in my research entitled:
Relationships among uncertainty, perceived social support, posttraumatic stress symptoms and psychological growth in patients with hematologic cancer in Korea

In exchange for this permission, I agree to submit to Dr. Mishel, upon completion of the study, a printout of the uncertainty data and an electronic submission or CD containing the data with the data dictionary. The data must contain information on each subject's age, sex, education, and diagnosis, along with data on each subject's response to each item on the scale. This data will be used to establish a normative database for clinical populations. No other use will be made of the data submitted. Credit will be given to me in reports of normative statistics that make use of the data I submitted for pooled analyses. Credit will be given to me in any reports referring to my findings.

8/27/14
(signature) (date)

Positions and full address of Investigator: Ji-Yeon Kim, RN, BSN
Graduate Student, Master's Program
College of Nursing, Seoul National University
103 Daehak-ro, Jong no-gu, Seoul, Korea
Email: pennpanper421@gmail.com

Permission is hereby granted to copy the GTUS for use in the research described above.

9-11-14
Merle H. Mishel Date

Please send two signed copies of this form to: Merle H. Mishel, PhD, FAAN; School of Nursing, CB #7460 Carrington Hall, University of North Carolina, Chapel Hill, NC 27599-7460

국문초록

본 연구는 혈액암으로 진단받고 치료중인 환자의 불확실성, 사회적지지, 외상 후 스트레스 증상과 심리적 성장을 파악하고, 불확실성과 사회적지지가 외상 후 스트레스 증상과 심리적 성장에 미치는 영향을 규명하여, 혈액암 환자들의 증상을 완화시킬 수 있는 중재방법 개발하는데 있어 기초자료를 제공하고자 하는 횡단적, 서술적 상관관계 연구이다.

연구대상은 서울특별시 소재 S 종합 병원에서 백혈병, 림프종, 다발성 골수종 등의 혈액암으로 진단받고, 적극적인 치료 혹은 외래에서 추후관리를 받고 있는 환자 166명을 대상으로 하였다. 2014년 6월 29일부터 9월 1일까지 연구에 참여하기로 동의한 혈액암 환자에게 설문지로 자료를 수집하였다.

연구도구로는 불확실성은 Mishel's Uncertainty in Illness Scale – Community form (MUIS-C)을, 사회적 지지는 Multidimensional Scale Perceived Social Support (MSPSS)를, 외상 후 스트레스 증상은 PTSD Checklist – Civilian version (PCL-C), 심리적 성장은 Growth Through Uncertainty Scale (GTUS)를 사용하였다.

수집한 자료는 SPSS/WIN 21.0프로그램을 이용하여 빈도, 백분율, 평균, 표준편차, t-test, one-way ANOVA, Scheffe 사후 검정, Pearson correlation, 다중회귀분석의 방법으로 분석하였고 다음과 같은 결과를 얻었다.

1) 불확실성은 평균 61.06(±13.64)점, 사회적 지지는 평균 42.79(±8.10)점, 외상 후 스트레스 증상은 평균 44.02(±13.45)점이고 심리적 성장은 132.10(±20.39)으로 나타났다.
2) 연령, 교육정도, 진단기간, 이식과 재발여부, 재발여부와 입원여부에 따라 불확실성이 통계적으로 유의한 차이가 있었다.
3) 교육정도, 혈액암 종류, 진단기간에 따라 사회적지지가 통계적으로 유의한 차이가 있었다.

4) 연령에 따라 외상 후 스트레스 증상이 통계적으로 유의한 차이가 있었다.
5) 불확실성, 사회적지지, 외상 후 스트레스 증상과 심리적 성장은 통계적으로 유의한 상관관계가 있었다 ($p<.001$).
6) 불확실성, 사회적지지가 외상 후 스트레스 증상에 영향을 미치는 요인임이 규명되었다 ($R^2=.312$, $p<.000$).
7) 사회적지지, 이식과 재발여부, 정신과치료여부와 경제상태가 심리적 성장에 영향을 미치는 요인임이 규명되었다 ($R^2=.231$, $p<.000$).

본 연구는 혈액암 환자의 불확실성, 사회적지지, 외상 후 스트레스 증상과 심리적 성장의 정도와 영향을 미치는 요인을 규명하여 혈액암 환자의 외상 후 스트레스를 완화할 수 있는 중재방법 개발에 기초 자료를 제공하였다는데 의의가 있다. 이를 바탕으로 외상 후 스트레스와 심리적 성장에 영향을 미치는 변수인 불확실성을 경감하고 사회적 지지를 증가시킬 수 있는 예방적 간호중재 프로그램을 개발하여 그 효과를 검증하는 연구가 필요하다.

주요어: 불확실성, 사회적지지, 외상 후 스트레스 증상, 심리적 성장, 혈액암
학번: 2012-20423